EMICAL
BRARY

"Sad Is the Day for Any Man When He Becomes Absolutely Satisfied with the Life He Is Living, the Thoughts That He Is Thinking and the Deeds That He Is Doing; When There Ceases to Be Forever Beating at the Doors of His Soul a Desire to Do Something Larger Which He Feels and Knows He Was Meant and Intended to Do."

Vol. XXI, No. 6 JUNE, 1932

JUL 5 1932

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

CONTENTS

Frontispiece and Sketch—Charles Clarence Sniteman 535
Editorial:
The National Formulary Exhibit at the American Medical Association Convention, New Orleans, La., May 9–13, 1932 536
The Prescription Department Phase of the National Drug Store Survey 538
The Committee on the Costs of Medical Care 539
Scientific Section:
Some Esters of Dialkylamino Methanols—Lynn and Lofgren 541
Toxicity of Methanol—Hufferd 548
Variation in Physiological Activity of Alcohols among Isomers and Homologs—Hufferd 549
A Study of the Germicidal Activity of Aromatic Sulphides—Moness, Braker and Christiansen 557
Examination of the Juices of the Leaves of Monarda Punctata and Monarda Fistulosa—Harwood 569
A Study of the Incompatability of Chloral Hydrate and Alcohol in the Presence of Soluble Salts—Hargreaves 571
Chemical Studies of the Fresh Juice of the Maguey Plant.—(Manso Fino, Karw)—Jones 574
Bibliography of Pharmaceutical Research—DuMez 576
The Solvent Extraction of Castor Oil Seeds—Swisher and Fiero 579
1932 National Pharmacy Week—October 10th–15th—Hogstad, Jr 583
Iowa Pharmacists' Exhibit at Iowa Medical Association 584
Frater Wilhelm Bodemann Broadcasts 585
Department of Business Management:
Advertising and Selling Problems of Drug Stores—Olsen 587
The Department of the American Association of Colleges of Pharmacy:
What Is Pharmacognosy?—Youngken 590
Materia Medica—How Defined?—Christensen 592
Committee Reports:
Report of the Vitamin Assay Committee of the American Drug Manufacturers' Association—Twenty-First Annual Meeting—April 1932—Holmes 596
Association Business 602
Proceedings of the Local Branches 605
Editorial Notes 621
Personal and News Items 623
Obituary 625
Societies and Colleges 626
Legal and Legislative 632
Book Notices and Reviews 634
Advertising—Cover Pages 2, 3 and 4, and pp. I–XXII.

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THE 80th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN TORONTO, CANADA, IN 1932—August 22nd–27th, Royal York Hotel, Headquarters, R. B. J. Stanbury, 43 Victoria St., Toronto 2, Canada, Local Secretary.

The 1932 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Toronto.

Entered as second-class Matter, January 23, 1917, at the Post Office at Easton, Pa., under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103. Act of October 3, 1917; authorized July 10, 1918.

GASTRON *with* IRON

A new preparation put up in 6 oz. bottles only, with a label easily removed for convenience in dispensing. Sold to the trade at the same price as Gastron plain.

Descriptive circular upon request

FAIRCHILD BROS. & FOSTER

New York

You can stand back of Mallinckrodt Ether..

In Anesthetic Ether the only valid sales argument is *"purity at the time the container is opened."*

In an intensive campaign to the medical profession, the Mallinckrodt Chemical Works offer free materials for a test more sensitive than U. S. P. demands.....which Mallinckrodt Ether *must* meet when the physician opens the can.

Check up on your Mallinckrodt Ether stock for the coming demands.. particularly the quarter pound size featured to general practitioners....

or write for further information on the new test and purity warranty.

ONE OF 1500

Mallinckrodt

FINE CHEMICALS

THE DUTY OF PHARMACY.

DEAN CHARLES F. HEEBNER,[1] in a message to the graduating class of Ontario College of Pharmacy, said in part: "Pharmacy is a combination of science and art. The average person thinks of pharmacy in terms of the average drug store, and he does not even understand a drug store. To him pharmacy is a merchandising enterprise that distributes a variegated assortment that includes medicines among other items.

CHARLES F. HEEBNER.

"He does not see the ramifying and intricate process that finally focuses in the prescription department of the corner drug store. The packaged medicine that he purchases there may have had its origin in the depths of an African forest or Indian jungle; it may have gone through manufacturing methods requiring the utmost exactness and scientific skill; it may have been blended with other therapeutic agents that only one in every fifteen hundred is competent to render. But the final buyer, the layman, sees nothing of the complicated and costly procedure that led up to its purchase.

"The fundamental obligation, the final duty of pharmacy is to provide, conveniently, quickly and at a moderate cost an unfailing supply of agents that prevent, alleviate or cure pain and disease.

"Your aim must be to keep the professional stamp on your store your greatest asset. That is why you chose pharmacy at first as your vocation."

---

[1] Dean Heebner graduated from New York College of Pharmacy with the class of 1881 and later was instructor for a time, before his election to the faculty of Ontario College of Pharmacy. He joined the AMERICAN PHARMACEUTICAL ASSOCIATION in 1894 and is now a life member.

CHARLES CLARENCE SNITEMAN.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXI JUNE, 1932 No. 6

CHARLES CLARENCE SNITEMAN.

Charles C. Sniteman, of Neilsville, Wis., has been a member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1881 and a resident of Neilsville for more than fifty-three years, making this city his home on January 15, 1879 and entering the drug business on his own account in 1881. He had been a partner in a Peoria drug store several years before matriculating at the Philadelphia College of Pharmacy in 1869; also for a time engaged with Allaire, Woodward & Co. Mr. Sniteman is an alumnus of the class of 1871.

George Sontag, a Neilsville youth, engaged with Mr. Sniteman about fifty years ago, and after completing his studies at the Philadelphia College of Pharmacy became a partner in the business, which association has continued up to the present time. These partners have maintained a business relationship and remained staunch friends—a record worthy of mention. The senior member contends that "retiring is of no use to men who have been working as long as I have; they do not live long after they retire. Human beings should remain useful as long as they are able to do so."

The prescription record of this pharmacy is good for a small city—the number filled is well over 429,000. The work in all divisions goes on without reference to system or detail, each partner sharing in the activities; their friendship record is 100; they have worked side by side, day in and day out to the present time. The friendship is reflected in their patronage who have the utmost confidence in these veteran pharmacists. We are indebted for the information for this brief sketch to Editor G. A. Bender, of the *Northwestern Druggist*, who also secured the loan of the photograph for the frontispiece. The hope is expressed that these veterans and fellow-members[1] may share many more years of health and happiness.

[1] Mr. Sniteman and Mr. Sontag are members of the AMERICAN PHARMACEUTICAL ASSOCIATION.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase Street, BALTIMORE, MD.

THE NATIONAL FORMULARY EXHIBIT AT THE AMERICAN MEDICAL ASSOCIATION CONVENTION, NEW ORLEANS, LA., MAY 9–13, 1932.

FOR the second time, the National Formulary occupied a booth in the scientific exhibit hall at the annual convention of the American Medical Association. This year the convention was held in New Orleans, and although the attendance did not approach that of the Philadelphia session of 1931, the warm and hearty approval of the attending physicians for the N. F. products, which were displayed, was just as marked and thorough as it was at the first showing.

Physicians made notes on the exhibited products, copied the typical prescriptions on their memo pads, sampled this and that, and enthusiastically endorsed the preparations and asked "why more of this was not done," as through these official preparations they seemed to see relief for many of their troubles of to-day.

The booth occupied by the National Formulary was in the center of a busy outside aisle and directly opposite a central aisle, a position of considerable advantage. The available space was about the same as that of last year, a three-sided booth, seven and one-half feet deep and eleven feet long. A shelf ran around the entire unit and the walls were draped with an attractive green material which extended to the floor. The general arrangement followed last year was again adopted in setting up the display, with large neatly printed signs near the top of each of the three walls and columnar signs beneath these, one to each preparation shown, fourteen in all. A small walnut table in the center of the booth carried two vases of flowers on either side of an attractive sign, in front of which was placed an open copy of the National Formulary.

It will be recalled that the exhibit in Philadelphia presented a group of vehicle elixirs and syrups together with typical prescriptions showing the masking qualities of the individual vehicles. Several of these were so outstanding in their value and in their acceptance by the attending physicians that they were used as the initial background in the exhibit at New Orleans and, in addition, several other popular and valuable preparations were added. These products were displayed in glass-labeled containers, bottles and jars, and beside each was a typical prescription showing the actual use of the preparation.

The large cards, previously mentioned, were designed to draw attention to the exhibit with catchy and timely phrases and the wording on the central one proved to be very effective with the following—"National Formulary vehicles make your prescriptions palatable." Likewise, the main cards on the sides were efficient with the one on the left reading—"Valuable N. F. Products—Better Prescriptions—Standard Formulas," while the one on the right carried this message, "Popular N. F. Preparations—Prescribed Daily." Under the latter sign were displayed Alkaline Aromatic Solution, Antiseptic Solution, Compound Mixture of Rhubarb and Glycerinated Elixir of Gentian, four of the most popular of the National Formulary preparations. The individual cards for these carried both Latin and English titles, together with a list of the ingredients; a word or two about the product's particular value and use and a copy of a typical prescription written in abbreviated Latin

form, and carrying the necessary directions for use. Beside each stock container was the filled prescription carrying a special label under the heading of the "N. F. Pharmacy."

The products on the left wing were Solid Petroxolin, Compound Menthol Inunction, Compound Menthol Spray and Calamine Lotion. The value of solid petroxolin was demonstrated in its use in a common prescription of to-day in which Balsam of Peru is prescribed in ointment form together with such items as sulphur and salicylic acid. Using petrolatum as a base, one finds that the Balsam reacts with the powders and produces a miserable looking ointment and one which separates and "rolls out" when applied to the body. However, this can be overcome by the judicious use of solid petroxolin, a preparation which is quite valuable as an ointment base, in many respects. Its consistence is good, its odor is very pleasing and it combines well with the general run of ointment items. In addition, it is of value, also, due to the fact that it is quite definitely absorbed by the skin, a quality which is often desired in an ointment base. Samples of both the good and the imperfect ointment were demonstrated in ointment jars, as well as in a thin film between two plates of glass, which clearly showed the marked differences in the two specimens. This ointment, as well as the compound inunction of menthol, was also put up in prescription form in collapsible tubes.

The "repeat" vehicles which occupied the main section at the rear of the booth consisted of the following:

Red Aromatic Elixir, a beautiful product, very popular in its colorless form, as official in the U. S. P., but not generally known with its bright red color as official in the National Formulary.

Compound Elixir of Taraxacum was stressed particularly because of its high alcoholic content, which enables a physician to use it as a vehicle for salts which require a large amount of alcohol in order to obtain a solution. This was nicely brought out in the case of phenobarbital which can be dissolved directly in the elixir to the extent of $^1/_4$ grain to one teaspoonful, while a small additional amount of alcohol will carry $^1/_2$ grain to one teaspoonful. Naturally, the physician was quick to perceive that by writing a compound prescription in this manner, he is helping to overcome the growing tendency of his patient toward self-medication. This habit is so easily encouraged by single item prescriptions which are readily read by the patient, who not only calls for the article by name at the drug store, but who immediately passes the information on to his friends that "so and so" is great to make you sleep, etc., etc. The growing tendency on the part of the public to self-medication with hypnotics of this type was generally recognized and the health of a community is seriously endangered when products of this nature are used without the direct supervision of a physician.

Compound Elixir of Vanillin—one of the most acceptable vehicle elixirs available, with its golden color and delightful odor and taste—was again very popular.

Syrup of Cocoa, which is of particular value when insoluble salts are prescribed, as in the case of quinine; the heavy-bodied syrup acting as a splendid suspending medium for the quinine.

Syrup of Cinnamon was found to be almost specific in its masking qualities with sodium salicylate and valuable for use with chloral hydrate; its dark color also added materially to its value.

Syrup of Raspberry, a splendid vehicle, was by far the most popular item on display. Its value in masking the intense saltiness of such items as the bromides and chlorides is truly remarkable. The sample prescription which contained 10 grains of sodium bromide to one teaspoonful did not last long, as those who tried it were continually sending their friends back to the booth to try "that raspberry bromide prescription." Pharmacists, who have tried to persuade physicians to sample their prescriptions, know what a difficult task it usually is, and still they were asking for that opportunity here.

Another four-page folder was made up for this year's exhibit, very similar in style to the one presented to the physicians last year. It carried in printed form the general information shown by the display, together with a few additional notes of interest to the prescribing physician. A large number of last year's booklets was also given out to those who had not attended the meeting in Philadelphia.

From the many contacts made during the several days that the exhibit was open, the writer is more than ever impressed by the fact that the general run of pharmacists do not appreciate the real opportunity which lies before them in the matter of selling "professional pharmacy and service" to the physicians of their communities. The physicians are extremely desirous to receive this information and service, and would gladly coöperate with the pharmacist who shows the slightest interest in that mutual question, "the health and comfort of a community." May our pharmacists awaken to the full possibilities of this service and take advantage of them now, for there never was a better opportunity offered for those who would like to practice real pharmacy—the N. F. exhibits at the A. M. A. conventions have proven that.—ADLEY B. NICHOLS, *Secretary, Committee on National Formulary.*

THE PRESCRIPTION DEPARTMENT PHASE OF THE NATIONAL DRUG STORE SURVEY.

AT THE National Drug Store Survey Conference in St. Louis, on April 26th and 27th, all results of the Survey available at that time were presented. It was agreed by the approximately 800 delegates that the great mass of practical information gathered during the year's intensive work would be of little value, unless all divisions of the drug and pharmaceutical activities studied and applied it to their particular needs. Hence, definite steps were taken to organize plans for nation-wide application of the information already obtained and to be obtained after further analysis of other material awaiting study.

The professional phase of the Survey has received careful attention and much important information is now available in the form of a printed report, released at the Conference, entitled "Prescription Department Sales Analysis in Selected Drug Stores" (Domestic Commerce Series No. 61). A study of this report will be found useful in the development of the prescription service.

In addition to the research carried on in the St. Louis pharmacies, the other investigations which have been made under the direction of the AMERICAN PHARMACEUTICAL ASSOCIATION on the determination of the use of U. S. P. and N. F. preparations and the surveys in various states on different phases of prescription practice and related activities will be stimulating and helpful to all divisions of pharmacy and the drug business, retail, wholesale and manufacturing.

Advantage is being taken of the opportunity to receive benefits from the Survey—The Superintendent of Documents in Washington, D. C., reports that all copies of the first printing were sold during the first month after the release of the report, and the second printing will be available shortly. It has been stated that several colleges of pharmacy are supplying students with copies for use in the respective courses of these schools. The sizes of orders from pharmacists vary in number; if all the retail druggists, the students in pharmacy, wholesalers and manufacturers could have copies and study the aims and purposes of the Survey, it is felt that the promotion of better conditions in the drug industry, which is the keynote of the National Drug Store Survey, would be well under way.

"Prescription Department Sales Analysis in Selected Drug Stores" is the first of a series of three reports on the professional phase of the Survey. The other two reports, which will be prepared and printed as soon as possible, will cover a study of two professional drug stores in St. Louis and one of operating costs and net profit in the 13 stores considered in the first report, respectively. A notice and review of the first report will be found in the last section of this number of the JOURNAL.

THE COMMITTEE ON THE COSTS OF MEDICAL CARE.

THE Committee on the Costs of Medical Care was organized in 1927, with Dr. Ray Lyman Wilbur, since appointed Secretary of the Interior by President Hoover, as chairman, "to study carefully all the economic aspects of the prevention and care of sickness, including the adequacy, availability and compensation of the persons and agencies concerned, and to recommend to the public and the professions various ways for improving the present situation." The members of the Committee represent the professions directly concerned, various institutions and special interests, economists, sociologists and the public, and constitute a group to which we may confidently look for thorough investigation, careful study and sound advice. It is not a governmental organization and is not dominated by any private interest. Its declared purpose is to find the best procedures for all concerned in the important question of medical care in its broadest sense.

The Committee's work was financed by a number of foundations interested in social progress; a five-year program of research was adopted in 1928; a research staff was secured; the work has been carried forward aggressively and the final report is expected to be released toward the end of this year. A number of studies dealing with various phases of medical care have been completed and printed.

Mr. Ambrose Hunsberger represents pharmacy on the committee and Dr. W. J. Schieffelin is a member representing the public. Dr. Robert P. Fischelis is a member of the research staff.

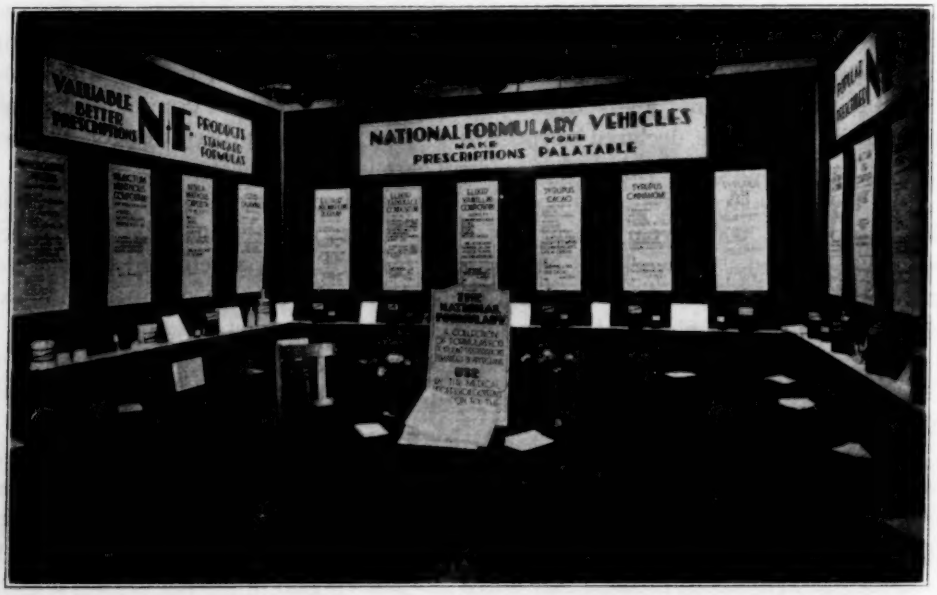
Such a comprehensive study as the committee has made has focused attention on the kind of medical care the public now receives and on the agencies that furnish it. Undoubtedly, some preconceived ideas have been or will be disproved and some information of an unexpected character will be developed. This should lead to sounder thought about medical care and a more intelligent approach toward making it available to all of the people at reasonable cost. It should link health with education as the basic requirements of a successful nation and demonstrate that the

well being of the people, and not self-interest, must be the first consideration of the professions licensed to render medical care. It is evident, too, that the public has no fixed preferences about the agency from which they receive the medical care they consider desirable.

Considerable attention has been given to pharmacy's services in medical care and to the cost of these services. Two members of the research staff, Dr. Rorem, an economist, and Dr. Fischelis, a pharmacist, were detailed to this study. They are to be commended, especially by pharmacists, for the broad view they took of pharmaceutical service and for the important place they have shown it to occupy in medical care. Pharmacy will profit by careful study, searching criticism and frank discussion of it, if honestly made and by informed persons. The results of this study have been published in book form and a review of it will be found in the "Book Review Section" of this issue of the JOURNAL.

Many students of pharmaceutical progress have felt that the profession and industry were drifting during recent years; that pharmacy had lost entity and purpose. This book should encourage them—that in spite of outward appearances, pharmacy is rendering a useful public health service and is apparently satisfying the people to a rather remarkable extent, which latter is no small accomplishment. Improvements are necessary, of course, and especially a recognition by those who follow it in any capacity, that pharmacy must take a more definite place in public health.

The Committee on the Costs of Medical Care will serve the public and the profession and industry, if it speaks out about what is expected of pharmacy in the new program and of the recognition that will be accorded it.—E. F. K.



National Formulary exhibit at the meeting of the American Medical Association in New Orleans, La., May 9–13, 1932.

SCIENTIFIC SECTION

SOME ESTERS OF DIALKYLAMINO METHANOLS.*[1]

BY E. V. LYNN AND FREDERICK V. LOFGREN.

In recent years numerous compounds have been made (1) by modifying the structure of procaine. These have been produced with the hope of discovering a better local anæsthetic and, to a less extent, in order to obtain more information about the relation between constitution and anæsthetic action. In every case the compounds had a higher molecular weight than procaine. These modifications have been produced by variations in one or more of the three units A, B and C of procaine:

$$\underset{A}{(C_2H_5)_2N} - \underset{B}{CH_2—CH_2} - \underset{C}{O—CO—C_6H_4—NH_2}.$$

In general the method of selection was more or less haphazard, which is usually the case in endeavors engendered by commercial profit, although by its means several useful anæsthetics have been manufactured. No attempt was made to proceed from simple to complex until sufficient evidence was evolved so that definite conclusions could be drawn as to the effect of structural changes on the physiological action.

The primary purpose of our investigation was to determine the effect of substitution of $—CH_2—$ for $—CH_2—CH_2—$ in position *B* on the procaine molecule. In the compounds prepared unit *A* was represented by diethylamino, di-*n*-propylamino, di-*n*-butylamino and diisoamylamino groups, while unit *C* was the benzoyl, *n*-aminobenzoyl, *p*-aminobenzoyl and cinnamyl groups. The present paper represents only the chemical preparation of the compounds made.

The dialkylamino methyl alcohols were first produced by the condensation of the corresponding amines with formaldehyde. These alcohols were then treated with the acyl chloride in 10 per cent sodium hydroxide solution. In all, sixteen compounds and the salts of eight of them were so made. The aminobenzoyl derivatives were prepared by reducing the corresponding nitro compounds.

The compounds produced in this manner were tested for anæsthetic properties by application to a muscle-nerve preparation and to the cornea of a rabbit. The results indicate that a number of the substances have local anæsthetic properties, although their irritant character militates against any practical employment. A subsequent paper will discuss the pharmacological experiments.

EXPERIMENTAL PART.

Di-Ethyl-Amino-Methyl-Benzoate.—Thirty grams of diethyl-aminomethyl alcohol (2) were treated with 45 grams of benzoyl chloride in the presence of an excess of 10 per cent sodium hydroxide. The mixture after cooling was extracted with ether. The liquid, remaining after evaporation of the solvent, was fractionally distilled under reduced pressure. The 22-gram fraction distilling at 150–160° C. under 16-mm. pressure was analyzed for nitrogen. The greater portion of the

* Presented to the Scientific Section, A. PH. A., Miami meeting, 1931.

[1] Submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy at the University of Washington.

fraction distilled at 157–158° C. under 16-mm. pressure. The substance was a pale yellow liquid, soluble in ether, chloroform, benzene, olive oil and absolute alcohol but was insoluble in water. Attempts were made to form salts, without success.

Per cent of nitrogen: found 6.83 and 6.86; calculated for $C_{12}H_{17}NO_2$, 6.76.

Di-n-Propyl-Amino-Methyl-Benzoate.—Using the same technique as for the preceding compound, 20 grams of di-*n*-propyl-aminomethyl alcohol (2) reacting with 25 grams of benzoyl chloride gave a 14-gram fraction of a liquid which distilled at 165–173° C. under 17-mm. pressure. The greater portion of this fraction distilled at 168–171° C. under 17-mm. pressure. The compound was a pale yellow liquid soluble in ether, chloroform, benzene, olive oil and absolute alcohol but insoluble in water. Attempts at manufacturing salts were unsuccessful.

Per cent of nitrogen: found 6.26 and 6.36; calculated for $C_{14}H_{21}NO_2$, 5.95.

Di-n-Butyl-Amino-Methyl-Benzoate.—Twenty-one grams of di-*n*-butylamino-methyl alcohol (3) on benzoylation with 20 grams of benzoyl chloride using the preceding technique and extracting with ether gave a 15-gram liquid fraction distilling at 180–190° C. under 17-mm. pressure. The greater portion of this liquid distilled at 187–188° C. under 17-mm. pressure. The substance was a pale, yellow liquid, soluble in ether, chloroform, benzene, olive oil and absolute alcohol but insoluble in water. No salts were obtained.

Per cent of nitrogen: found 5.33 and 5.07; calculated for $C_{16}H_{25}NO_2$, 5.32.

Di-iso-Amyl-Amino-Methyl-Benzoate.—Seventeen grams of diisoamylamino-methyl alcohol (2) and 14 grams of benzoyl chloride were benzoylated as above and extracted with ether. The residue after evaporation of the ether gave, upon distillation at 16-mm. pressure, a 15-gram fraction which boiled at 190–195° C. with the greater portion boiling at 193–194° C. This fraction was analyzed. It was a yellowish liquid soluble in ether, chloroform, benzene, olive oil and absolute alcohol but insoluble in water. No salts were obtained.

Per cent of nitrogen: found 4.87 and 5.07; calculated for $C_{18}H_{29}NO_2$, 4.80.

Di-Ethyl-Amino-Methyl-Cinnamate.—Ten grams of diethylaminomethyl alcohol and 18 grams of cinnamoyl chloride were mixed together with an excess of 10 per cent sodium hydroxide solution. After the reaction had ceased and the mixture had cooled, it was extracted with ether. The residual liquid remaining after evaporation of the ether was subjected to fractional distillation under reduced pressure. The 9-gram fraction distilling at 180–195° C. under 17-mm. pressure was analyzed by determination of nitrogen. The greater portion of this fraction distilled at 190° C. under 17-mm. pressure and on cooling solidified to a white solid melting at 66–67° C. The product was insoluble in water but soluble in ether, chloroform, benzene, olive oil and absolute alcohol.

Per cent of nitrogen: found 5.94 and 6.39; calculated for $C_{14}H_{19}NO_2$, 6.00.

Sulphate.—The sulphate of this compound was obtained by adding a saturated solution of concentrated sulphuric acid in ether to an ether solution of the base. A white crystalline salt separated immediately from the mixture and was washed

several times with ether. The salt had a melting point of 121–122° C. and hydrolyzed upon addition of water.

Per cent of H_2SO_4: found 29.96; calculated for $C_{14}H_{19}NO_2.H_2SO_4$, 29.60.

Di-n-Propyl-Amino-Methyl-Cinnamate.—Using the same technique as in preparing the preceding compound, 10 grams of di-*n*-propylaminomethyl alcohol and 13 grams of cinnamoyl chloride upon fractional distillation under 16-mm. pressure gave a 10-gram portion distilling at 205–215° C. which upon cooling formed a white crystalline solid melting at 54° C. This compound was insoluble in water but soluble in ether, chloroform, benzene, olive oil and absolute alcohol.

Per cent of nitrogen: found 5.29 and 5.67; calculated for $C_{16}H_{23}NO_2$, 5.36.

Sulphate.—The sulphate of this compound was prepared as above except that the salt separated from the ether slowly. This sale was a white crystalline solid melting at 113–114° C. and apparently hydrolyzed when added to water.

Per cent of H_2SO_4: found 27.04; calculated for $C_{16}H_{23}NO_2.H_2SO_4$, 27.29.

Di-n-Butyl-Amino-Methyl-Cinnamate.—Fifteen grams of di-*n*-butylaminomethyl alcohol and 15 grams of cinnamoyl chloride upon benzoylation as with the preceding cinnamates were extracted with ether. The residue after evaporation of the ether was distilled under reduced pressure and the fraction distilling at 210–228° C. under 14-mm. pressure was analyzed. The greater portion of this fraction distilled at 226–227° C. under 14-mm. pressure. The distillate upon cooling was an amber-colored liquid, insoluble in water but soluble in chloroform, ether, benzene, olive oil and absolute alcohol. No salts of this base were obtained.

Per cent of nitrogen: found 4.96 and 5.15; calculated for $C_{18}H_{27}NO_2$, 4.84.

Di-iso-Amyl-Amino-Methyl-Cinnamate.—Using the same general method as in preparing the other cinnamates, 12 grams of diisoamylaminomethyl alcohol and 11 grams of cinnamoyl chloride were allowed to react together. The residue remaining from the ether extraction after evaporating the ether was subjected to distillation under reduced pressure. The 11-gram fraction distilling at 210–230° C. under 11-mm. pressure was reserved for analysis. The greater portion of this distillate came over at 227–229° C. The product was a thick, amber-colored liquid soluble in ether, chloroform, benzene, olive oil and absolute alcohol but insoluble in water. No salts of this base were obtained.

Per cent of nitrogen: found 4.66 and 4.66; calculated for $C_{20}H_{31}NO_2$, 4.41.

Di-Ethyl-Amino-Methyl-m-Nitro-Benzoate.—Twelve grams of diethylaminomethyl alcohol were treated with 22 grams of *m*-nitrobenzoyl chloride in the presence of an excess of 10 per cent sodium hydroxide. Upon completion of the reaction, the mixture was shaken with ether. Upon evaporation of the ether, the oily residue remaining was distilled under reduced pressure. A 10-gram product distilling between 200–207° C. under 11-mm. pressure was obtained which upon cooling formed a white crystalline solid melting at 70–72° C.

Per cent of nitrogen: found 11.90 and 11.71; calculated for $C_{12}H_{16}N_2O_4$, 11.11.

Di-Ethyl-Amino-Methyl-m-Amino-Benzoate.—Five grams of diethylaminomethyl-*m*-nitrobenzoate were reduced by dissolving in an excess of concentrated

hydrochloric acid and adding granulated zinc to the product. Upon completion of the reaction the solution was made distinctly alkaline with sodium hydroxide and the oily layer was removed by shaking out with ether. The oily residue left after evaporation of the ether was distilled under reduced pressure. The fraction distilling at 200–208° under 11-mm. pressure was analyzed. Upon cooling, it formed a yellow crystalline solid which melted at 75–76° C.

Per cent of nitrogen: found 13.45 and 13.39; calculated for $C_{12}H_{18}N_2O_2$, 12.61.

Monohydrochloride.—This salt was prepared by passing dry hydrogen chloride into an anhydrous ether solution of the base. The sticky white precipitate was dissolved in a small amount of absolute alcohol and white crystals separated upon the addition of purified ethyl acetate. The salt was further purified by crystallization two additional times from a mixture of alcohol and ethyl acetate. The salt was soluble in water and had a melting point of 184–185° C.

Per cent of HCl: found 14.09; calculated for $C_{12}H_{18}N_2O_2.HCl$, 14.36.

Di-n-Propyl-Amino-Methyl-m-Nitro-Benzoate.—Using the Schotten-Baumann reaction, 12 grams of di-*n*-propylaminomethyl alcohol and 17 grams of *m*-nitrobenzoyl chloride in the presence of 10 per cent sodium hydroxide solution were allowed to react together. After the reaction mixture had cooled, it was extracted with ether, the ether was evaporated and the oily liquid remaining was subjected to fractional distillation under reduced pressure. The 13-gram portion, distilling between 205–219° C. at 11-mm. pressure was reserved for analysis. It was a brownish, oily liquid, the greater portion of which boiled at 213–218° C. at 11-mm. pressure.

Per cent of nitrogen: found 10.71 and 10.66; calculated for $C_{14}H_{20}N_2O_4$, 9.99.

Di-n-Propyl-Amino-Methyl-m-Amino-Benzoate.—Five grams of di-*n*-propylaminomethyl-*m*-nitrobenzoate were reduced with hydrochloric acid and zinc. The oily liquid, which was obtained from this mixture by making alkaline with sodium hydroxide solution, extracting with ether and finally evaporating off the solvent, was distilled under reduced pressure. The 2-gram product, distilling at 205–210° C. under 9-mm. pressure was reserved for analysis. It was a brownish, oily liquid

Per cent of nitrogen: found 12.03 and 11.19; calculated for $C_{14}H_{22}N_2O_2$, 11.19.

Monohydrochloride.—This salt was prepared by passing dry hydrogen chloride into an anhydrous ether solution of the base. Yellowish white crystals were obtained by recrystallizing three times from ethyl acetate after dissolving in a small amount of absolute alcohol. The crystals which were soluble in water had a melting point of 141–142° C.

Per cent of HCl: found 13.10; calculated for $C_{14}H_{22}N_2O_2.HCl$, 12.72.

Di-n-Butyl-Amino-Methyl-m-Nitro-Benzoate.—Using a similar reaction as in preparing the other-*m*-nitrobenzoates 12 grams of di-*n*-butyl-amino-methyl alcohol were mixed with 15 grams of *m*-nitrobenzoyl chloride in the presence of 10 per cent sodium hydroxide solution. The oily liquid recovered from the ether extraction of the reaction mixture was fractionally distilled under reduced pressure. The 12 grams of product distilling at 205–230° C. under 11-mm. pressure were analyzed.

Most of this distillate came over at 227–228° C. under 11-mm. pressure. The product was a thick, brownish liquid.

Per cent of nitrogen: found 9.55 and 9.32; calculated for $C_{16}H_{24}N_2O_4$, 9.09.

Di-n-Butyl-Amino-Methyl-m-Amino-Benzoate.—This compound was manufactured as the other *m*-aminobenzoates by reduction of 5 grams di-*n*-butylaminomethyl-*m*-nitrobenzoate with hydrochloric acid and zinc, extraction of the alkaline reaction mixture with ether and fractional distillation of the oily liquid remaining after evaporation of the ether. The 2-gram fraction boiling between 215–220° C. under 10-mm. pressure was analyzed. The product was a thick, brownish liquid.

Per cent of nitrogen: found 10.26 and 9.92; calculated for $C_{16}H_{26}N_2O_2$, 10.06.

Monohydrochloride.—This salt was prepared from the base in the usual manner. It was recrystallized three times from ethyl acetate after dissolving in a small amount of absolute alcohol. The yellowish white salt had a melting point of 159–160° C. It was soluble in water.

Per cent of HCl: found 11.81; calculated for $C_{16}H_{26}N_2O_2$.HCl, 11.58.

Di-iso-Amyl-Amino-Methyl-m-Nitro-Benzoate.—Twelve grams of diisoamylaminomethyl alcohol and 12 grams of *m*-nitrobenzoyl chloride were mixed together with an excess of 10 per cent sodium hydroxide solution. The reaction mixture was extracted with ether and the oily residue remaining after evaporation of the ether was fractionally distilled. The 8-gram fraction distilling at 220–234° C. under 11-mm. pressure was reserved for analysis. The product was a viscid brown liquid; the greater portion of which distilled at 230–233° C. under 11-mm. pressure.

Per cent of nitrogen: found 8.71 and 8.75; calculated for $C_{18}H_{28}N_2O_4$, 8.33.

Di-iso-Amyl-Amino-Methyl-m-Amino-Benzoate.—Five grams of diisoamylaminomethyl-*m*-nitrobenzoate were reduced with hydrochloric acid and zinc. The reaction mixture after making alkaline with sodium hydroxide solution was extracted with ether, the solvent evaporated and the oily residue was distilled under reduced pressure. The 2-gram portion distilling between 220–233° C. under 10-mm. pressure was analyzed. This substance was a thick, brownish liquid.

Per cent of nitrogen: found 8.95 and 8.92; calculated for $C_{18}H_{30}N_2O_2$, 9.14.

Monohydrochloride.—The salt was obtained by passing dry hydrogen chloride into an anhydrous ether solution of the diisoamylaminomethyl-*p*-aminobenzoate. The precipitate was purified by recrystallizing three times from ethyl acetate after dissolving in a small amount of absolute alcohol. The salt was in the form of nearly white granules which melted at 178–180° C. It was soluble in water but apparently hydrolyzed.

Per cent of HCl: found 11.07; calculated for $C_{18}H_{30}N_2O_2$.HCl, 10.64.

Di-Ethyl-Amino-Methyl-p-Nitro-Benzoate.—Ten grams of diethylaminomethyl alcohol were mixed with 18 grams of *p*-nitrobenzoyl chloride in presence of an excess of 10 per cent sodium hydroxide solution. The reaction mixture after cooling was extracted with ether and subsequently the solvent was removed by evaporation. The oily residue was distilled under reduced pressure. The 10-gram fraction boiling

at 200–211° C. under 10-mm. pressure was analyzed. At room temperature this product solidified forming a yellow crystalline mass melting at 62–63° C.

Per cent of nitrogen: found 11.62 and 11.84; calculated for $C_{12}H_{16}N_2O_4$, 11.11.

Di-Ethyl-Amino-Methyl-p-Amino-Benzoate.—Five grams of diethylamino-methyl-*p*-nitrobenzoate were reduced with hydrochloric acid and zinc. After reaction had ceased the mixture was made distinctly alkaline with sodium hydroxide and extracted with chloroform. The chloroform was evaporated leaving an oily liquid which was distilled under reduced pressure. The 2-gram portion distilling at 200–215° C. was analyzed. It solidified at room temperature to form a yellow crystalline solid with a melting point of 121–122° C.

Per cent of nitrogen: found 13.03 and 13.17; calculated for $C_{12}H_{18}N_2O_2$, 12.61.

Monohydrochloride.—This salt was prepared by passing dry hydrogen chloride into an absolute ether solution of the base. The salt was purified by crystallization from purified ethyl acetate after dissolving in a little absolute alcohol. It was a white crystalline solid, soluble in water and melting at 189–190° C.

Per cent of HCl: found 13.85; calculated for $C_{12}H_{18}N_2O_2.HCl$, 14.09.

Di-n-Propyl-Amino-Methyl-p-Nitro-Benzoate.—Using the same technique as in preparing the corresponding diethylamino compound, 17 grams of di-*n*-propyl-aminomethyl alcohol and 25 grams of *p*-nitrobenzoyl chloride were permitted to react together. The oily liquid obtained from the ether extraction was distilled under diminished pressure. The 11-gram portion distilling at 210–233° C. under 17-mm. pressure was reserved for analysis. It was a yellowish white solid at room temperature melting at 37–39° C.

Per cent of nitrogen: found 10.21 and 10.11; calculated for $C_{14}H_{20}N_2O_4$, 9.99.

Di-n-Propyl-Amino-Methyl-p-Amino-Benzoate.—Five grams of di-*n*-propyl-aminomethyl-*p*-nitrobenzoate were reduced as in the preceding compounds. The base was extracted from the reaction mixture with ether. The oily residue from the ether was distilled under reduced pressure. The 2-gram fraction, distilling at 215–220° C. under 9-mm. pressure, was reserved for analysis. At room temperature it solidified to form a yellowish white crystalline mass melting at 75–76° C.

Per cent of nitrogen: found 11.37 and 10.90; calculated for $C_{14}H_{22}N_2O_2$, 11.19.

Monohydrochloride.—This salt was obtained in the usual manner. It was purified three times by recrystallization from ethyl acetate after dissolving in absolute alcohol. The yellowish white crystals were soluble in water and had a melting point of 152–153° C.

Per cent of HCl: found 13.02; calculated for $C_{14}H_{22}N_2O_2.HCl$, 12.72.

Di-n-Butyl-Amino-Methyl-p-Nitro-Benzoate.—Twelve grams of di-*n*-butyl-aminomethyl alcohol and 15 grams of *p*-nitrobenzoyl chloride were allowed to react in the usual manner. The reaction mixture was extracted with ether and the thick liquid recovered from the solvent was fractionally distilled under reduced pressure. The 6-gram fraction distilling at 210–235° C., under 11-mm. pressure was reserved. It was a thick, brownish liquid the greater part distilling at 230–234° C. under 11-mm. pressure.

Per cent of nitrogen: found 9.38 and 9.16; calculated for $C_{16}H_{24}N_2O_4$, 9.09.

Di-n-Butyl-Amino-Methyl-p-Amino-Benzoate.—Five grams of the di-*n*-butyl-aminomethyl-*p*-nitrobenzoate were reduced in the usual manner and extracted from the reaction mixture with chloroform and ether. The oily liquid residue recovered from the solvent was distilled under reduced pressure. The 1-gram fraction distilling between 210–228° C. under 9-mm. pressure was reserved and analyzed. It was a thick, brownish liquid.

Per cent of nitrogen: found 9.94 and 9.62; calculated for $C_{16}H_{26}N_2O_2$, 10.06.

Monohydrochloride.—This salt was obtained in the usual manner. It was recrystallized three times from ethyl acetate and absolute alcohol. It was a white crystalline substance with a melting point of 136–137° C. It was soluble in water but apparently was hydrolyzed very easily.

Per cent of HCl; found 11.98; calculated for $C_{16}H_{26}N_2O_2.HCl$, 11.58.

Di-iso-Amyl-Amino-Methyl-p-Nitro-Benzoate.—Twelve grams of diisoamyl-aminomethyl alcohol and 12 grams of *p*-nitrobenzoyl chloride were allowed to react as before. The oily residue from the ether extraction of the reaction mixture was distilled under reduced pressure. The 6-gram portion distilling at 220–235° C. under 8-mm. presssure was reserved for analysis. The greater portion of this fraction distilled at 232–233° C. under 8-mm. pressure. It formed a solid crystalline mass which melted at 52–54° C.

Per cent of nitrogen: found 8.38 and 8.67; calculated for $C_{18}H_{28}N_2O_4$, 8.33.

Di-iso-Amyl-Amino-Methyl-p-Amino-Benzoate.—Five grams of diisoamyl-aminomethyl-*p*-nitrobenzoate were reduced as before and extracted from the reaction mixture with ether. The oily residue recovered from the solvent was distilled under diminished pressure. The 2-gram fraction distilling at 220–235° C. under 10-mm. pressure was analyzed. It was a viscid, brown liquid.

Per cent of nitrogen: found 9.03; calculated for $C_{18}H_{30}N_2O_2$, 9.14.

Monohydrochloride.—This salt was manufactured in the same manner as the preceding salts. It was recrystallized five times from ethyl acetate and absolute alcohol. The salt was in the form of nearly white granules. It was soluble in water but apparently hydrolyzed immediately.

Per cent of HCl: found 11.26; calculated for $C_{18}H_{30}N_2O_2.HCl$, 10.64.

SUMMARY.

1. The following series of esters have been prepared and their physical properties studied: di-ethyl-amino-methyl-benzoate, di-*n*-propyl-amino-methyl-benzoate, di-*n*-butyl-amino-methyl-benzoate and di-iso-amyl-amino-methyl-benzoate.

2. A second, third and fourth series of esters consisting of the *m*-amino-benzoates, *p*-amino-benzoates and cinnamates of the corresponding di-alkyl-amino-methanols were also prepared and studied. Soluble salts of most of these were obtained.

3. These esters were studied pharmacologically as to their local anæsthetic properties which will be reported in a subsequent paper.

REFERENCES.

(1) Fränkel, "Arzneimittel Synthese," 6th Edition, pages 348–391; McElvain, *J. Am. Chem. Soc.*, 46 (1924), 1721; *Ibid.*, 48 (1926), 2179; *Ibid.*, 48 (1926), 2239; *Ibid.*, 49 (1927), 2835; McElvain and co-workers, *Ibid.*, 46 (1924), 1221; *Ibid.*, 49 (1927), 2862; *Ibid.*, 50 (1928), 3348; *Ibid.*, 51 (1929), 922; *Ibid.*, 51 (1929), 887; *Ibid.*, 52 (1930), 1633; Gilman and Pickens, *Ibid.*, 47 (1925), 245; Gilman, Heckert and McCracken, *Ibid.*, 50 (1928), 437; Adams and co-workers, *Ibid.*, 48 (1926), 1758; *Ibid.*, 49 (1927), 1303; *Ibid.*, 49 (1927), 1307; Jones and Major, *Ibid.*, 49 (1927), 1527; Marvel and Sandborn, *Ibid.*, 50 (1928), 563; Marvel and Shelton, *Ibid.*, 51 (1929), 915; Blicke and Blake, *Ibid.*, 52 (1930), 235; Bolyard, *Ibid.*, 52 (1930), 1030; Hartung and Munch, *Ibid.*, 51 (1930), 2570.

(2) Henry, *Ber.*, 28 (1895), 851.

(3) This was prepared by using the method of Henry, *Ber.*, 28 (1895), 851. Specific gravity at 20° C., 0.8526.

TOXICITY OF METHANOL.

BY RALPH W. HUFFERD.

A total of 77 white rats were given very pure[1] methanol and ethanol by stomach-tube. Concentrations of 40–50% by volume were administered.

Toxicity was studied for single doses and for doses repeated once and twice at intervals of one day.

ETHANOL.

		One Dose.		Two Doses.		Three Doses.	
Mols./100 Gm.	Cc./100 Gm.	Killed.	Lived.	Killed.	Lived.	Killed.	Lived.
0.022	1.3	...	1	...	...	...	...
0.021	1.25	1	...	...	...	...	...
0.018	1.07	5	...	...	...	...	...
0.014	0.84	...	..	...	1	1	...
0.013	0.75	2	...	2	3	1	1
0.01	0.6	...	...	2	...	1	2

METHANOL.

0.036	1.47	1	...	...	...	...	...
0.031	1.25	5	4	...	...	...	...
0.025	1.00	3	5	1	1	...	...
0.019	0.75	2	...	5	1	...	...
0.016	0.66	...	...	...	...	5	5
0.012	0.5	...	...	...	8	1	2
0.01	0.4	...	...	...	...	1	4

All of the rats that did not die regained strength and weight rapidly, giving every appearance of being normal.

Irritation of the eyes was observed only in the case of some of the animals that finally died.

From these data it would appear that very pure methanol is slightly less toxic for rats than is pure ethanol even in repeated doses.

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[1] Methods of purification and tests for purity are described in another paper to be printed in THIS JOURNAL.

VARIATION IN PHYSIOLOGICAL ACTIVITY OF ALCOHOLS AMONG ISOMERS AND HOMOLOGS.*

BY RALPH W. HUFFERD.[1]

Exact knowledge of the comparative physiological potencies of the aliphatic alcohols is needed in the production of synthetic drugs, especially those of the anæsthetic group. A survey of the literature shows many contradictions. It seems to the writer that this confusion has come from two sources; the use of impure alcohols, and the choice of resulting conditions that do not permit of accurate observation. It is the object of the present investigation to make a new study in which special care is taken to avoid these difficulties.

EXPERIMENTAL PROCEDURE.

The alcohols were administered to guinea pigs by stomach-tube, care being taken to avoid measurable loss. The C_1, C_2 and C_3 members were diluted to 40% by volume after they had been measured. With the exception of tertiary butyl alcohol the higher alcohols were given without diluting. The animals were watched constantly for at least an hour and were then observed at 15-minute intervals until the maximum effect was past.

All pigs were of over 300-Gm. weight after 4 to 6 hours fasting without water. In a few cases longer fasting was tried but proved too severe on the animals, causing rapid loss of weight and strength. The pigs were standardized by testing their resistance to ethyl alcohol, the few that reacted abnormally being discarded.

It was first decided to determine the smallest quantities that would produce deep narcosis. This was found to be a poor condition to observe accurately. It also approached too closely to the lethal dose to permit of further use of the pigs except after a long rest. However, it was found in this attempt that guinea pigs show 5 rather well-defined stages of narcosis with most alcohols. Due to its narrow limits, one of these, the C condition, was chosen as the standard. The five stages are:

A. Sluggishness or drowsiness.

B. Loss of control of the hind legs.

C. Loss of control of the hind and fore legs to such an extent as to make locomotion impossible.

D. Narcosis from which the animal cannot be roused by holding it up by the hind legs and shaking it violently.

D+. Narcosis so deep that no reaction is produced by pinching the skin of the back between the hind shoulders, a very sensitive spot.

PURIFICATION OF ALCOHOLS.

According to the statement of the manufacturer, most of the alcohols were prepared through the Grignard reaction and were of considerable purity. Nevertheless, they were subjected to extensive fractionation, both the boiling range and the refractive index of each fraction being recorded.

All distillations were made through columns similar to the one described by Skinner and Noyes (3).

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* Presented before the Biological Section at the 81st meeting of the American Chemical Society, Indianapolis, Ind., March 30 to April 3, 1931.

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The refractometer used is of the Abbe type and gave the values 1.3331 and 1.3718 at 20° for water and acetic acid, respectively.

All physical properties used for comparison were taken from "International Critical Tables."

Anschutz thermometers corrected to ±0.2° were used. All boiling points were corrected according to Alex. Smith's value (4) for associated liquids.

Methanol—Acetone Free. B. P. 64.5°, N_D^{20} 1.329.

Acetone-free methanol was distilled from dilute hydrochloric acid and then once from commercial quick lime and 3 times from activated lime (2). 1500 cc. of this material was redistilled, the middle fraction of 500 cc. being collected. This sample was then subjected to fractionation as shown in the following table.

Fraction.	B. P.	N_D^{20}.	Fraction.	B. P.	N_D^{20}.
1	64.5–64.7	1.3289	1	64.5–64.7	1.3287
2	64.7–64.9	1.3291	2	64.7–64.8	1.3287
3	64.9–	1.3292	3	64.8–65.0	1.3288
4	64.9–	1.3291	4	65.0–65.1	1.3287
5	64.9–65.0	1.3292	5	65.1–65.4	1.3288
6	65.0–65.1	1.3292			
7	65.1–65.3	1.3293	3 and 4 were combined for use.		

3, 4, 5 and 6 were combined and redistilled.

Methanol—Synthetic. B. P. 64.5°, N_D^{20} 1.329.

A sample of synthetic methanol was distilled from activated lime after two hours refluxing and then fractionated as follows:

Fraction.	B. P.	N_D^{20}.	Fraction.	B. P.	N_D^{20}.
1	.....	1.3303	1	64.3–64.7	1.3293
2	.....	1.3305	2	64.7	1.3292
3	.....	1.3307	3	64.7–65.0	1.3293
4	.....	1.3309	4	65.0–66.0	1.3300
5	.....	1.3310	2 and 3 were combined for use.		
6	.....	1.3311			

3, 4 and 5 were combined and redistilled.

Ethyl Alcohol—100%. B. P. 78.5°, N_D^{20} 1.3617.

A middle fraction of 2 liters was cut out of a 5-liter sample of industrial alcohol. This was redistilled and the first and last 500-cc. fractions discarded. The resulting product was refluxed with commercial lime for 3 hours and distilled off on a steam-bath. The distillate was refluxed with activated lime. The process was repeated 3 times. The final distillate had a volume of about 500 cc. It was fractionated, the first and last fractions of 150 cc. each being discarded. The middle fraction was fractionated as follows:

Fraction.	B. P.	N_D^{20}.	Fraction.	B. P.	N_D^{20}.
1	78.1–78.2	1.3608	4	78.3–	1.3612
2	78.2–78.3	1.3612	5	78.3–78.4	1.3612
3	78.3–	1.3612	res.	.....	1.3612

Fractions 3 and 4 were combined for use.

Ethyl Alcohol—96%.

Industrial alcohol was distilled from lime without refluxing, and then cut into

3 equal fractions by distillation. The middle fraction was used. It has a specific gravity at 20° referred to water at 4° of 0.8013, showing it to have a purity of 96%.

n-Propyl Alcohol. B. P. 97.8, N_D^{20} 1.3854.

Fraction.	B. P.	N_D^{20}.
1	95.9	1.3838
2	95.9–96.3	1.3839
3	96.3–96.5	1.3839
4	96.5–96.7	1.3839
5	96.7–96.8	1.3840

3, 4 and 5 were combined and refluxed with activated lime.

1	–96.1	1.3840
2	96.1–96.7	1.3840
3	96.7–97.1	1.3841
4	97.1–97.3	1.3841
5	97.3–97.5	1.3841
res.	.....	....

3, 4 and 5 were combined and redistilled.

Fraction.	B. P.	N_D^{20}.
1	–96.5	1.3848
2	96.5–96.7	1.3845
3	96.7–97.2	1.3847
4	97.2–97.4	1.3847
res.	.....	....

3 and 4 were combined and redistilled.

1	97.1	1.3846
2	97.1–97.3	1.3847
3	97.3–97.5	1.3846
res.	.....	....

2 and 3 were combined for use.

Isopropyl Alcohol. B. P. 82.3, N_D^{20} 1.3776.

The middle fraction of a sample of the alcohol was refluxed with activated lime and then redistilled as follows:

Fraction.	B. P.	N_D^{20}.
1	–81.4	1.3792
2	81.4–81.9	1.3787
3	81.9–82.1	1.3790
res.	.....	....

The 3 fractions were combined and again treated with activated lime. The distillate boiled constant at 82.3° but was white. It was redistilled, yielding clear distillate as follows:

1	–82.3	1.3768
2	82.3–	1.3772
res.	.....	....

Fraction 2 was used.

n-Butyl Alcohol. B. P. 117.7, N_D^{20} 1.3991.

Fraction.	B. P.	N_D^{20}.
1	–116.8	....
2	116.8–117.8	1.3975
3	117.8–118.5	1.3977
4	118.5–118.5	1.3978
res.	.....	.....

Fraction 3 was used.

Isobutyl Alcohol. B. P. 107.3°, N_D^{20} 1.396.

Fraction.	B. P.	N_D^{20}.
1	–105.4	1.3940
2	105.4–106.0	1.3941
3	106.0–106.4	1.3942
4	106.4–106.4	1.3940

2 and 3 were combined and redistilled.

Fraction.	B. P.	N_D^{20}.
1	107.1	1.3937
2	107.1–107.2	1.3938
res.	.....	....

Fraction 2 was used.

sec.-Butyl Alcohol. B. P. 99.5°, N_D^{20} 1.397.

Fraction.	B. P.	N_D^{20}.
1	–98.5	1.3964
2	98.5–98.9	1.3963
3	98.9–99.3	1.3964
res.	.....	....

Fraction 3 was used.

tert.-Butyl Alcohol. B. P. 82.8°, N_D^{20} 1.387, M. P. 25°.

Fraction.	B. P.	N_D^{20}.
1	–81.1	1.3860
2	81.1–81.9	1.3867
res.	.....	....

Fraction 2 was refluxed with activated lime and distilled.

Fraction.	B. P.		
1	81.1	1.3863	m. p. 20°
2	81.1–81.4	1.3867	m. p. 23°
res.	.....	....	m. p. 18°

Fraction 2 was used.

n-Amyl Alcohol. B. P. 137.9°, N_D^{13} 1.414, $N_D^{14.6}$ 1.4096.

Fraction.	B. P.	N_{20}^{D}.
1	–137.3	1.4087
2	137.3–137.8	1.4087
3	137.8	1.4089

Fraction.	B. P.	N_D^{20}.
4	137.8	1.4089
5	137.8–138.3	1.4088
res. (1/3)	.....	....

Fractions 4 and 5 were combined for use.

Isoamyl Alcohol. B. P. 130.5°, N_D^{20} 1.4075.

Fraction.	B. P.	N_D^{20}.
1	–130.8	1.4058
2	130.8–131.5	1.4060

Fraction.	B. P.	N_D^{20}.
3	131.5–131.6	1.4060
res.	.....	1.4060

Fraction 3 was used.

sec.-Amyl Alcohol (methyl *n*-propyl carbinol). B. P. 119.5°, N_D^{20} 1.4072.

Fraction.	B. P.	N_D^{20}.
1	–118.8	1.4058
2	118.8–119.8	1.4064
3	119.8–120.0	1.4063
4	120.0–120.2	1.4063
5	120.2–121.3	1.4063
res.	.....	....

2, 3, 4 and 5 were combined and redistilled.

Fraction.	B. P.	N_D^{20}.
1	115.8–117.8	1.4057
2	117.8–119.3	1.4058
3	119.3–120.0	1.4063
4	120.0–120.3	1.4064
res.	.....	1.4073

3 and 4 were combined for use.

tert.-Amyl Alcohol (dimethyl ethyl carbinol). B. P. 101.8°, N_D^{20} 1.406.

Fraction.	B. P.	N_D^{20}.
1	– 99.7	1.4030
2	99.7–100.7	1.4037

Fraction.	B. P.	N_D^{20}.
3	100.7–101.5	1.4038
res.	.....	1.4038

Fraction 3 was used.

n-Hexyl Alcohol. B. P. 155.8.

Fraction.	B. P.	N_D^{20}.
1	–151.8	....
2	151.8–152.8	1.4145
3	152.8–153.3	1.4152
4	153.3–154.3	1.4156
5	154.3–155	1.4157
6	155 –155.8	1.4158
7	155.8–156.5	1.4160
res.	.....	1.4171

3, 4, 5 and 6 were combined and redistilled.

Fraction.	B P.	N_D^{20}.
1	–150.8	1.4140
2	150.8–153.8	1.4152
3	153.8–155.8	1.4158
res.	.....	1.4160

2 and 3 were combined and redistilled.

1	–153.8	1.4143
2	153.8–154.8	1.4163
res.	.....	1.4163

Fraction 2 was used.

sec.-Hexyl Alcohol (methyl *n*-butyl carbinol). B. P. 131.9°, N_D^{20} 1.411.

Fraction.	B. P.	N_D^{20}.	Fraction.	B. P.	N_D^{20}.
1	–138.8	1.4148	3	139.3–139.5	1.4150
2	138.8–139.3	1.4148	res.	.....	1.4148

Fraction 3 was used.

tert.-Hexyl Alcohol (dimethyl *n*-propyl carbinol). B. P. 123°.

Fraction.	B. P.	N_D^{20}.	Fraction.	B. P.	N_D^{20}.
1	–122.8	1.4079	2	122.8–123.8	1.4087

Fraction 2 was used.

n-Heptyl Alcohol. B. P. 175.8°, N_D^{20} 1.425.

Fraction.	B. P.	N_D^{20}.	Fraction.	B. P.	N_D^{20}.
1	–174.4	1.4207	res.	.....	....
2	174.4–174.9	1.4212	Fraction 2 was used.		

sec.-Heptyl Alcohol (di *n*-propyl carbinol). B. P. 155.4°, N_D^{20} 1.421

Fraction.	B. P.	N_D^{20}.	Fraction.	B. P.	N_D^{20}.
1	–153.8	1.4130	3	155.3–156.3	1.4150
2	153.8–155.3	1.4145	res.	.....	....

Fraction 3 was used.

n-Octyl Alcohol. B. P. 194°, N_D^{20} 1.430.

Fraction.	B. P.	N_D^{20}.	Fraction.	B. P.	N_D^{20}.
1	–189.9	1.4273	4	192.9–193.1	1.4290
2	189.9–191.9	1.4290	res.	.....	1.4295
3	191.9–192.9	1.4290	Fraction 4 was used.		

n-Nonyl Alcohol. B. P. 215°, N_D^{20} 1.4338.

Fraction.	B. P./28 mm.	N_D^{20}.	Fraction.	B. P./28 mm.	N_D^{20}.
1	–112	1.4320	1	116–117	1.4326
2	112–113	1.4325	res.	.....	1.4329
res.	.....	1.4338	Fraction 1 was used.		

Fraction 2 was redistilled.

1	–113	1.4315	3	115–118	1.4328
2	113–115	1.4324	res.	.....	1.4343

Fraction 3 was redistilled.

EXPERIMENTAL RESULTS.

	No Effect.	A.	B.	C.	Mols./100 Grams. D.	D+.	Killed.
			Methanol-Acetone Free.				
	(9)	(21)	(22)	(7)	(2)	(1)	(4)
Max.	0.0087	0.0126	0.0176	0.0186	0.0357	0.0225	0.0357
Min.	0.0064	0.0079	0.0092	0.0156	0.0357	....	0.0157
Av.	....	0.0099	0.0136	0.0173	0.0357	....	....
			Methanol-Synthetic.				
	(2)		(8)	(5)	(4)		(2)
Max.	0.0161	....	0.0163	0.0186	0.0363	....	0.0363
Min.	0.0129	....	0.0099	0.0129	0.0129	....	0.0186
Av.	....	....	0.0129	0.0148	0.0208	....	....
			Ethyl Alcohol—100%.				
		(3)	(9)	(14)	(4)	(3)	(2)
Max.	....	0.0076	0.0086	0.0092	0.0094	0.0144	0.0128
Min.	....	0.0067	0.0067	0.0067	0.0092	0.0128	0.0128
Av.	....	0.0070	0.0071	0.0084	0.0093	0.0133	....

Ethyl Alcohol—96%.

	(2)	(3)	(10)	(5)	(9)		
Max.	0.0032	0.0047	0.0081	0.0087	0.0089	....	....
Min.	0.0031	0.0042	0.0038	0.0047	0.0064	....	....
Av.	....	0.0045	0.0052	0.0070	0.0077	....	....

n-Propyl Alcohol.

		(5)	(3)	(8)	(4)		(4)
Max.	....	0.00228	0.00335	0.00402	0.00402	....	0.00402
Min.	....	0.00174	0.00268	0.00268	0.00268	....	0.00335
Av.	....	0.00201	0.00295	0.00322	0.00322	...	....

Isopropyl Alcohol.

		(8)	(4)	(7)	(4)		
Max.	....	0.00353	0.00353	0.00484	0.00524	....	....
Min.	....	0.00151	0.00262	0.00288	0.00327	....	....
Av.	....	0.00249	0.00302	0.00393	0.00434	....	....

n-Butyl Alcohol.

		(3)	(3)	(7)	(9)		
Max.	....	0.00085	0.00093	0.00109	0.00131	....	....
Min.	....	0.00077	0.00052	0.00069	0.00085	....	....
Av.	....	0.00082	0.00073	0.00089	0.00102	...	....

Isobutyl Alcohol.

		(3)	(7)	(3)	(4)		
Max.	....	0.00108	0.00119	0.00108	0.00130	....	....
Min.	....	0.00069	0.00057	0.00108	0.00097	....	....
Av.	....	0.00087	0.00099	0.00108	0.00114	....	....

sec.-Butyl Alcohol.

		(5)	(10)	(9)	(6)		
Max.	....	0.00095	0.0012	0.00131	0.00131	....	....
Min.	....	0.00051	0.00069	0.00076	0.00093	....	....
Av.	....	0.00077	0.00096	0.00093	0.00114	....	....

tert.-Butyl Alcohol.

		(11)	(5)	(6)	(6)		
Max.	....	0.00133	0.0016	0.00195	0.00195	....	....
Min.	....	0.00064	0.00091	0.00149	0.00128	....	....
Av.	....	0.00096	0.00126	0.00176	0.00182	....	....

n-Amyl Alcohol.

	(1)	(3)	(5)	(2)	(7)		
Max.	0.00056	0.00065	0.00070	0.00067	0.00074	....	....
Min.	.....	0.00060	0.00065	0.00067	0.00065	....	....
Av.	.....	0.00062	0.00067	0.00067	0.00069	....	....

Isoamyl Alcohol.

	(1)	(2)	(2)	(2)	(7)		
Max.	0.00055	0.00065	0.00060	0.00065	0.00074	....	....
Min.	.....	0.00055	0.00060	0.00060	0.00046	....	....
Av.	.....	0.00060	0.00060	0.00063	0.00067	....	....

sec.-Amyl Alcohol.

		(9)	(3)	(6)	(12)		
Max.	.....	0.00046	0.00051	0.00055	0.00055	....	....
Min.	.....	0.00018	0.00046	0.00046	0.00037	....	....
Av.	.....	0.00034	0.00049	0.00052	0.00045	....	....

tert.-Amyl Alcohol.

		(3)	(2)	(9)	(5)		
Max.	.....	0.00037	0.00046	0.00056	0.00060	....	....
Min.	.....	0.00037	0.00046	0.00037	0.00042	....	....
Av.	.....	0.00037	0.00046	0.00046	0.00051	....	....

n-Hexyl Alcohol.

	(4)	(2)			(3)	(3)	
Max.	0.00068	0.00080	.....	.....	0.00080	0.00080	....
Min.	0.00064	0.00068	.....	.....	0.00068	0.00072	....
Av.	.....	0.00074	.....	.....	0.00076	0.00075	....

sec.-Hexyl Alcohol.

	(1)			(4)	(4)	(1)	
Max.	0.00041	.....	.....	0.00051	0.00051	0.00041	....
Min.	.....	.....	.....	0.00033	0.00041	.....	....
Av.	.....	.....	.....	0.00039	0.00043	.....	....

tert.-Hexyl Alcohol.

	(1)		(1)	(6)	(8)	(2)	(1)
Max.	0.00020	.....	0.00020	0.00027	0.00032	0.00030	0.00020
Min.	.....	.....	.....	0.00020	0.00024	0.00020	.....
Av.	.....	.....	.....	0.00025	0.00028	0.00025	.....

n-Heptyl Alcohol.

	(5)	(3)		(1)	(1)	(2)	(3)
Max.	0.00106	0.00106	.....	0.00106	0.00151	0.00106	0.00141
Min.	0.00042	0.00071	.....	.....	.....	0.00106	0.00106
Av.	.....	0.00085	.....	.....	.....	0.00106	.....

sec.-Heptyl Alcohol.

	(3)	(1)	(1)	(1)	(3)	(2)	
Max.	0.00056	0.00044	0.00032	0.00035	0.00056	0.00046	.....
Min.	0.00035	.....	.....	.....	0.00035	0.00035	.....
Av.	.....	.....	.....	.....	0.00046	0.00040	.....

n-Octyl Alcohol.

	(10)						
Max.	0.0016	.....	.....	.....	.....	.....	.....
Min.	0.0005	.....	.....	.....	.....	.....	.....

n-Nonyl Alcohol.

	(9)						
Max.	0.0014	.....	.....	.....	.....	.....	.....
Min.	0.0005	.....	.....	.....	.....	.....	.....

Average values compared with ethyl alcohol = 1.

DISCUSSION OF RESULTS.

The choice of ethyl alcohol as a standard for comparison is based on the great consistence of the results that it gave and the fact that it contains a carbon to carbon linkage, thus giving it closer relationship to the higher homologs than is possessed by methanol.

The discrepancy existing between 96% and 100% ethyl alcohol is not explained but is in accord with the observations of Atkinson (1).

The differences shown by the two samples of methanol probably have little or no significance.

As has been stated, of all of the conditions the C permits of most accurate observation. However, the B gives values very closely paralleling those of C.

The values obtained seem to be sufficiently definite to place the alcohols in their respective positions with considerable confidence. It was never possible to obtain either the B or C condition with *n*-hexyl alcohol but values calculated from the A and D values indicate clearly that the drop in activity among the normal homologs starts with it.

The data seem to explain why there have been so many differences of opinion expressed as to variation among isomers. The order of increasing strength among the butyl alcohols is reversed by the amyl isomers.

The drop in narcotic power of the normal homologs is very great. In the single case of the heptyl member it appears to be accompanied by marked increase in toxicity. Doses of *n*-octyl and *n*-nonyl equivalent to one and a half times the C dose of *n*-butyl alcohol in no instance had any visible effect.

An interesting observation in connection with tertiary butyl alcohol is its powerful inebriating effect. For several hours after recovering sufficiently from the C and D conditions to be on their feet the pigs will run wildly and unsteadily when disturbed.

The extent to which most of the samples had to be purified to yield successive fractions of constant boiling point and refractive index leaves little question but that workers who did not carefully purify their alcohols (many of them did not) have worked with very impure materials.

ACKNOWLEDGMENT.

Acknowledgment is made to Edgar M. Adams for assistance in the experimental work of the problem.

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(1) Atkinson, JOUR. A. PH. A., 17 (1928), 28.
(2) Danner and Hildebrand, *J. Am. Chem. Soc.*, 44 (1922), 2826.
(3) Skinner and Noyes, *Ibid.*, 39 (1917), 2718.
(4) Smith and Menzies, *Ibid.*, 32 (1910), 907.

PHARMACEUTICAL ETHICS IN THE MIDDLE AGES.

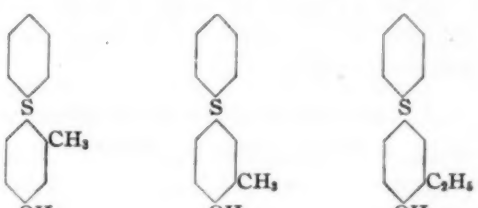
Pharmaceutical ethics was a reality in the Middle Ages, and he who infringed it was held severely to account. The distinction between physician and pharmacist was sharply drawn and no encroachment on the part of one profession on the prerogatives of the other was permitted. A curious oath dating from the fourteenth century, which all who were licensed as apothecaries were obliged to take, read as follows: "I swear not to malign any of my former masters, physicians, pharmacists or others, whoever they may be; to uphold, as far as in me lies, the honor, glory, ornament and majesty of medicine; not to disclose to idiots and ingrates their secrets and mysteries; to do nothing rashly, without the counsel of physicians or in the hope of gain; to disown and to avoid like the plague the disreputable and entirely pernicious methods of practice now followed by charlatans, empirics and dabblers in alchemy, to the great disgrace of the magistrates who tolerate them. May the Lord prosper me as I observe these conditions."—From *The Pharmaceutical Journal of New Zealand.*

A STUDY OF THE GERMICIDAL ACTIVITY OF AROMATIC SULPHIDES.*

BY E. MONESS, W. BRAKER AND W. G. CHRISTIANSEN.

Hilbert and Johnson (1) found that *p*-hydroxy diphenyl sulphide has a phenol coefficient of 115. They also prepared 4-hydroxy, 4′-methyl diphenyl sulphide, expecting this compound to have a still greater germicidal activity, because it is well known that the introduction of a methyl group into the benzene ring of a phenolic germicide generally increases the activity. However, this compound was found to have a much lower activity, namely, a phenol coefficient of only 50. In view of this unexpected result, we investigated the effect of introducing the alkyl group into the hydroxylated ring of *p*-hydroxy diphenyl sulphide, because we believed that the lower activity of the methylated compound referred to above was due to the presence of the methyl group in the non-hydroxylated ring.

Three compounds were prepared: 4-hydroxy 2-methyl diphenyl sulphide (I); 4-hydroxy 3-methyl diphenyl sulphide (II); and 3-ethyl 4-hydroxy diphenyl sulphide (III).



I II III

In the preparation of these compounds, as well as some of the others described below, it was found most convenient to use the Hinsberg (2) reaction, which permits the preparation of our sulphides readily from any derivatives of phenol by reacting with benzene sulphinic acid:

$$2C_6H_5SO_2H + C_6H_5OH = C_6H_5SC_6H_4OH + C_6H_5SO_2OH + H_2O.$$

Benzene sulphinic acid was most readily prepared by the method of Knoevanagel (3).

The Hinsberg reaction has the disadvantage of giving a crude product, which according to the author himself, is undistillable. We found that while the crude reaction product obtained in the preparation of *p*-hydroxy diphenyl sulphide could be distilled by exercising great care and using a very high vacuum, such distillation became impossible with the increase in the complexity of the phenol used. We overcame this difficulty by purification of the crude reaction product preliminary to distillation. This consisted essentially in boiling the tarry product with gasoline, which dissolved the sulphide, leaving some of the tar behind. The gasoline extract was then evaporated to dryness, and the resulting residue again treated with gasoline. This treatment yielded a much lighter product, light red instead of almost black, which could be easily distilled *in vacuo*. In this manner the Hinsberg reaction yielded pure products, which were used for the determina-

* Scientific Section, A. PH. A., Miami meeting, 1931.

tion of their germicidal activity. This study gave very interesting and unexpected results as will appear from the following tabulation.

Dilution in Which Germicide Kills.

Compound.	Typhoid. 5 min.	Typhoid. 10 min.	Staphylococcus. 5 min.	Staphylococcus. 10 min.
4-hydroxy diphenyl sulphide	15000	20000	5000	5000
2-methyl 4-hydroxy diphenyl sulphide	1000	1500	5000	10000
3-methyl 4-hydroxy diphenyl sulphide	500	500	25000	25000
3-ethyl 4-hydroxy diphenyl sulphide	5000	5000	20000	30000

A definite shift of germicidal activity from typhoid to staphylococcus is noted as a result of the introduction of the methyl group. This shift becomes most pronounced when the methyl group is in the ortho position to the hydroxyl. The introduction of an alkyl group higher than the methyl group, in this case the ethyl group, causes a general rise in germicidal activity as compared with the methyl group. This gives cause to assume that with the alkyl group still higher, there would be a further increase in germicidal activity.

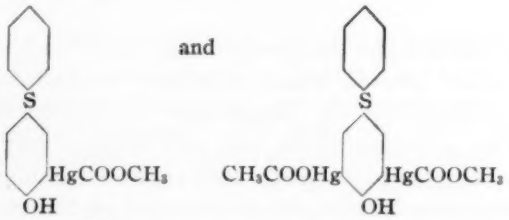
It is also of interest to note that high activity both with respect to typhoid and staphylococcus, can be obtained by using a mixture of equal weights of *p*-hydroxy diphenyl sulphide and 3-methyl 4-hydroxy diphenyl sulphide. Such a mixture gave the following results:

Dilution in Which Germicide Kills.

Typhoid. 5 min.	Typhoid. 10 min.	Staphylococcus. 5 min.	Staphylococcus. 10 min.
15000	15000	10000	20000

The effect of mercuration of these compounds was next studied. The mercury compounds were prepared by dissolving the sulphide in alcohol, and slowly adding to it with heating and stirring, an acidified aqueous solution of mercuric acetate. When the reaction mixture no longer gives a test for mercury ions, the reaction is complete. The solution is filtered and alkalinized with dilute alkali. A slight residue is filtered off, and the filtrate carefully neutralized with acetic acid. The compound was isolated as a white powder.

The resultant product is almost always a mixture of the mono- and di-mercury compounds:

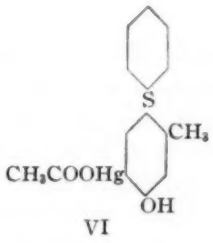


IV V

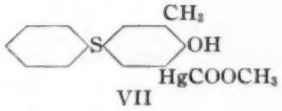
In only one instance did we obtain a compound which analyzed for (IV). On the other hand, the preparation of the di-mercury compound (V) proceeds smoothly and is obtained pure without difficulty. (IV) is easily soluble in dilute alkali, but (V) can be kept in alkaline solution only when the solution is protected against absorption of CO_2 from the air by an inert gas such as nitrogen.

Using the method outlined above, 2-methyl 4-hydroxy 5-acetoxy mercuri

diphenyl sulphide (VI) was prepared without difficulty. On the other hand, it was found impossible to prepare in this manner 3-methyl 4-hydroxy 5-acetoxy mercuri diphenyl sulphide:



VI



VII

It would seem that the reason for this failure is the position of the methyl group, which being ortho to the hydroxyl, prevents the mercury residue from orienting itself meta to the methyl group.

Compound VI was almost insoluble in dilute alkali; and, therefore, no results are available at present on this compound. The di-mercury compound of *p*-hydroxy diphenyl sulphide (V) is distinctly less germicidal than the mono-mercury compound (IV) and even the latter is not appreciably more active than the *p*-hydroxy diphenyl sulphide (I) from which it was prepared.

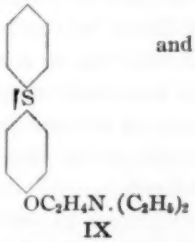
In the single instance in which we obtained (IV), the active dilution was 1–15,000 for typhoid and 1–20,000 for staphylococci in 10 minutes. For a mixture of 40% of (IV) and 60% of (V) the germicidal activity was 1–20,000 for typhoid and 1–2500 for staphylococci in 10 minutes. The mercury compounds of *p*-hydroxy diphenyl sulphide have thus no advantage over the sulphide itself, and when the hydroxylated ring contains an alkyl group the mercury derivatives are very insoluble.

The hydroxyl group is as essential to the germicidal activity of the aryl phenolic sulphides as for the ordinary phenols. Any blocking of this group by the formation of ethers has a very great effect in lowering the germicidal activity. Three compounds of this nature were prepared:

VIII

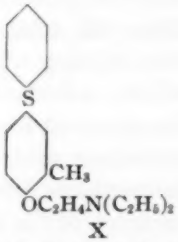
p-Ethoxy diphenyl sulphide.

and



IX

p-Diethyl amino ethoxy diphenyl sulphide.



X

2-Methyl 4-diethyl amino ethoxy diphenyl sulphide.

In preparing (VIII) *p*-brom phenetol was heated with sodium thiophenate in the presence of Cu, resulting in the splitting off of sodium bromide and the formation of (VIII). (IX) and (X) were prepared by heating an alcoholic solution of the sodium salt of the hydroxy diphenyl sulphide with diethyl amino ethyl bromide.

The germicidal activity for these compounds is as follows:

Dilution in Which the Germicide Kills in 10 Mins.

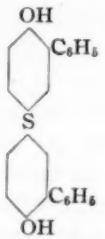
Compound.	Typhoid.	Staphylococci.
VIII	1000	1000
IX	4000	400
X	5000	400

(IX) and (X) are interesting because they yield water-soluble hydrochlorides which are neutral to litmus. Though as germicides they are not very active, there is a possibility of usefulness for these, since they have been found to have trypanicidal activity, and also have distinct activity as local anæsthetics.

This importance of the hydroxyl group for germicidal activity suggested the study of dihydroxy diphenyl sulphides. The greater solubility of the mercury derivatives of such compounds in dilute alkali was the reason for the preparation and testing of some of the latter.

Two compounds were prepared: 4-4′ dihydroxy diphenyl sulphide (XI) and 3-3′ diphenyl 4-4′ dihydroxy diphenyl sulphide (XII):

XI



XII

The method used was that of Tassinari (4) and consisted in reacting a carbon disulphide solution of a phenol with a similar solution of SCl_2 in the cold

$$2C_6H_5OH + SCl_2 = (C_6H_4OH)_2S + 2HCl.$$

Sulphur dichloride was prepared from sulphur chloride-S_2Cl_2 by conducting a stream of dry chlorine into the sulphur chloride in the presence of some activated charcoal as a catalyst, keeping the temperature below $+3°$ C.

The reaction between the phenol and the sulphur dichloride is conducted with cooling, adding the solution of the latter to the solution of the former dropwise, with constant stirring. When the reaction is complete, the solvent is removed by evaporation, and the residue is dissolved in dilute potassium hydroxide (the compound is obtained from this solution by precipitation with CO_2).

The procedure works with modifications also for the reaction between ortho-hydroxy diphenyl and sulphur dichloride.

The presence of the 2 hydroxyl groups in these compounds did not, however, have the expected effect of raising the germicidal activity; on the contrary, the activity was greatly decreased.

Dilution in Which the Germicide Kills in 10 Mins.

Compound.	Typhoid.	Staphylococci.
XI	1500	300
XII	2000	3000

In an attempt to prepare a mono-mercury derivative of XI we found that

again a mixture of mono- and di-mercury compounds resulted. On the other hand, there was no difficulty encountered in the preparation of the di-mercury compound. The expected greater solubility of these compounds in dilute alkali was fully realized. The mixture consisting of 70% mono-mercurated and 30% di-mercurated *p-p'*-dihydroxy diphenyl sulphide dissolved with the use of only one mol. of alkali in excess of the equivalent quantity while the di-mercury compound required 4 mols. in excess; nitrogen protection was not needed for the stability of the latter solution.

The germicidal activity of these mercury compounds, however, was not as expected: not only was it not higher than the compounds from which they were made, but it was even lower:

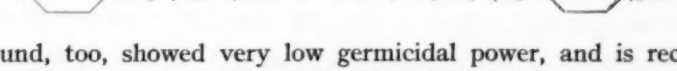
Dilution in Which Germicide Kills in 10 Mins.

Compound.	Typhoid.	Staphylococci.
70% mono- and 30% di-mercurated *p-p'*-dihydroxy diphenyl sulphide	750	750
Di-acetoxy mercuri *p-p'*-dihydroxy diphenyl sulphide	1250	500

In the course of our work on the symmetrical di-aryl sulphides we also prepared 4-4'-diamino diphenyl sulphide:

XIII

originally with the intention of using it in the preparation of 4-4'-dihydroxy diphenyl sulphide. However, the method of Tassinari was found to be preferable. (XIII) was prepared by the method of Merz and Weith (5). This consists essentially in heating aniline and sulphur together in the presence of lead oxide according to the following reaction:



This compound, too, showed very low germicidal power, and is recorded here, because in conjunction with the results obtained with the dihydroxy diphenyl sulphides, it seems to indicate that the germicidal activity is due neither to the hydroxy group nor to the sulphur linkage alone, but to the grouping, where there is a phenolic ring on one side of the sulphur and a benzene nucleus on the other.

The substitution of an alkyl for the benzene group in the compounds under study was found to produce compounds of comparatively high germicidal potency. This is illustrated in the case of the one compound of this type prepared by us, namely,

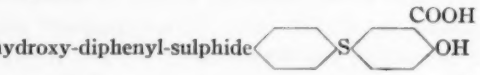
p-Hydroxyphenyl normal amyl sulphide:

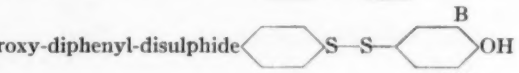
XIV

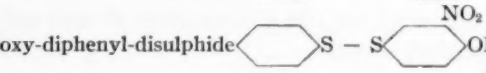
This was prepared by the reduction of *p*-methoxy benzene sulphonyl chloride to the corresponding *p*-methoxy thiophenol, and reacting the sodium salt of the latter with normal amyl bromide in alcoholic solution. The methoxy compound was subsequently demethylated yielding (XIV). This compound was active against typhoid in a dilution of 1 in 2500 in 10 minutes, and against staphylococci

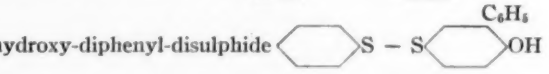
in a dilution of 1 in 10,000 in 5 minutes, and compares favorably with the activity of 2-methyl-4-hydroxy-diphenyl sulphide.

We had also intended to study the effect on the germicidal power of aryl phenolic sulphides of introducing carboxyl, halogen, nitro and phenyl groups into the ring containing the hydroxyl group. It was found, however, that under the conditions of the Hinsberg reaction only the compound containing the carboxyl group gave the desired sulphide; in the other instances disulphides were obtained. While it is true that the Hinsberg reaction tends to give a small percentage of disulphide even with phenol, a tendency which is increasingly apparent with the introduction of the higher alkyl groups, it is interesting to note that in the cases mentioned above, the product is almost exclusively the disulphide. Four compounds were thus prepared:

3-carboxy-4-hydroxy-diphenyl-sulphide  XV

3-brom-4-hydroxy-diphenyl-disulphide  XVI

3-nitro-4-hydroxy-diphenyl-disulphide  XVII

and 3-diphenyl-4-hydroxy-diphenyl-disulphide 

In each case the corresponding phenol was reacted with benzene sulphinic acid according to the Hinsberg reaction, and purified as already described.

The germicidal power of all of these compounds was found to be low:

Dilution in Which Germicide Kills.

Compound	Typhoid.		Staphylococci.
XV	500	in 10 mins.	500
XVI and XVII	1000		1000
	in 1 min. but inactive in greater dilutions.		

EXPERIMENTAL PART.

Preparation of p-Hydroxy Diphenyl Sulphide by Modified Hinsberg Reaction.

Seventy-three grams of benzene sulphinic acid (2 mols.) were treated with 26.3 Gm. (1 mol.) of phenol. Eight grams of concd. H_2SO_4 were employed as the condensation agent. The mixture was heated on the steam-bath for 8 hours. It was then shaken with Na_2CO_3 solution and excess phenol driven over by steam. Concentrated HCl acid was then added and a dark red oil separated out. The latter was extracted with ether, then the ether solution was washed successively with Na_2CO_3 solution and water. The extract was dried over Na_2SO_4 and the ether then distilled off. Thirty-six grams of crude product were thus obtained corresponding to a 65% yield.

The crude *p*-hydroxy-diphenyl-sulphide was purified by gasoline, cf. previous discussion, and the oil thus obtained was distilled under diminished pressure. Twenty-five grams of a light yellow oil were thus obtained. By redistillation we obtained 20.0 Gm. of a clear viscous oil, the boiling point of which at 3–4 mm. was 162–164° C.

Yield—36.0% of pure compound.
Analysis: Calculated for $C_{12}H_{10}OS$: S, 15.86%. Found: S, 15.65%.

This compound was also prepared by the Grignard and Ziegler reactions as described by Hilbert and Johnson (1) but we obtained better yields by the modified Hinsberg reaction.

Preparation of 3-Methyl-4-Hydroxy Diphenyl Sulphide.

The method used in this experiment was that employed in the preparation of *p*-hydroxy diphenyl sulphide, but using ortho cresol instead of phenol. A 42% yield of a crystalline compound was obtained. The boiling point at 4 mm. was 185–190° C., melting point 72° C.

Analysis: Calculated for $C_{13}H_{12}OS$: S, 14.81%. Found: S, 14.85%.

Preparation of 2-Methyl-4-Hydroxy Diphenyl Sulphide.

This compound was prepared by the modified Hinsberg reaction using meta cresol. The boiling point of the substance was 192–197° C. at 5 mm.

Analysis: Calculated for $C_{13}H_{12}OS$: S, 14.81%. Found: S, 14.48%.

Preparation of 3-Ethyl-4-Hydroxy Diphenyl Sulphide.

The *o*-ethyl phenol necessary for the preparation of this sulphide was prepared by a modification of the method of Resenmund and Schnurr (6), rearranging the acetic ester of phenol to the corresponding ketone with subsequent reduction of the latter.

Phenyl acetate, prepared in the usual manner, was rearranged as follows: To 65 Gm. of phenyl acetate, 28 Gm. of $AlCl_3$ was added slowly, the reaction proceeding with evolution of HCl and rise of temperature. After all the $AlCl_3$ had been added, the mixture was heated on the oil-bath for $1^1/_2$ hours at a temperature of 170–180° C. The melt which is a reddish brown glass was powdered and added in small portions to one liter of approximately normal HCl. A dark, almost black, oil separates out, which was steam distilled, yielding 27.5 Gm. of ortho-acetyl phenol, since the para compound does not come over with steam. This was distilled *in vacuo* and all came over at 103–105° C. at 13-mm. pressure.

Twenty-four grams of ortho-acetyl phenol was added to 500 cc. of a 50–50 mixture of concentrated hydrochloric acid and water, 50 cc. of alcohol and 25 Gm. of zinc amalgam. This was heated on the steam-bath with vigorous stirring for 8 hours, or until the oil no longer gave a purple color with ferric chloride. The oil was steam distilled and extracted with ether. After evaporating off the ether, the oil was redistilled, yielding 12 Gm. of ortho-ethyl phenol:

Analyses: Carbon: Found, 78.5%; calculated, 78.6%
Hydrogen: Found, 8.1%; calculated, 8.2%
} for $C_8H_{10}O$.

The *o*-ethyl phenol was then reacted with benzene sulphinic acid, as described for 4-hydroxy diphenyl sulphide. After the gasoline purification, 14 Gm. of a red oil were obtained from the 12 Gm. of ortho-ethyl phenol used, which is a yield of 61.9%. This was distilled giving 9 Gm. of light yellow oil, which came over

between 190–205° C. at 7-mm. pressure. This analyzed 16.53% for sulphur as against 13.91% for the calculated value, giving rise to the supposition that some disulphide was present. This was therefore reduced with zinc and hydrochloric acid and was steam distilled. Thiophenol was found in the distillate. The contents of the flask were then extracted with ether (having previously dissolved all of the zinc with hydrochloric acid) and after evaporation of the solvent, 3.4 Gm. of a clear oil were obtained, which was the desired 3-ethyl-4-hydroxy diphenyl sulphide.

Analysis: Sulphur: Found, 13.89%; calculated for $C_{14}H_{14}SO$ 13.91%.

Preparation of p-Ethoxy Diphenyl Sulphide.

Two and nine-tenths grams of sodium (7) were dissolved in 40 cc. of absolute alcohol and 14.3 Gm. of thiophenol added. The alcohol was then distilled off. Twenty-eight grams of *p*-brom phenetol and 0.4 Gm. of copper powder were added. The reaction mixture was then heated on the oil-bath at 280° C. for 8 hours. The semi-solid mass was then extracted with alcohol, acidified and after adding zinc, was steam distilled. The zinc salt solution was extracted with ether; the latter was dried over anhydrous sodium sulphate and evaporated. The yield was very small.

Analysis: Sulphur: Found, 13.45%; calculated for $C_{14}H_{14}SO$ 13.91%.

Preparation of the Hydrochloride of Diethyl Amino Ethyl Ester of p-Hydroxy Diphenyl Sulphide.

Six and six one-hundredth grams of *p*-hydroxy diphenyl sulphide were added to a solution of 1.38 Gm. of sodium in 58 cc. of absolute alcohol. To the resulting solution 7.83 Gm. of diethyl amino ethyl bromide hydrobromide, dissolved in 58 cc. of alcohol, were added. The mixture was refluxed on the steam-bath for 15 hours. The salt resulting from the reaction was filtered off, and the alcohol evaporated off. The residue was taken up in dilute HCl. Any unreacted hydroxy diphenyl sulphide was removed by extracting with ether. The solution was then made alkaline and steam distilled to remove any excess diethyl amino ethyl bromide. The alkaline solution was now extracted with ether, and the dried ether extract was treated with dry HCl gas. This precipitated the hydrochloride of diethyl amino ethyl ether of *p*-hydroxy diphenyl sulphide.

Analysis: Sulphur: Found, 9.05%; calculated for $C_{18}H_{24}SONCl$ 9.48%.

The compound dissolves easily in water and is neutral to litmus and congo red.

The diethyl amino ethyl ether of 3-methyl 4-hydroxy diphenyl sulphide was prepared in the manner outlined above. The hydrochloride, after pouring off the ether, and drying retains free HCl tenaciously.

Analyses: Sulphur: Found, 8.70%; calculated, 9.10%
Chlorine: Found, 12.04%; calculated, 10.07%
} for $C_{19}H_{26}SONCl$.

This indicates the presence of about 4% of free HCl still present. This can be eliminated by protracted heating at 100° C.

Preparation of 4-4'-Dihydroxy Diphenyl Sulphide (4).

Ninety-four grams of phenol were dissolved in 150 cc. of CS_2. The solution was cooled and held at 0–5° C. SCl_2 in 100 cc. of CS_2 was then added dropwise with constant stirring; HCl came off steadily and a solid mass separated from the solution. The CS_2 was then distilled off, leaving a grayish solid mass. This was dissolved in KOH, diluted with about 5 volumes of water, and filtered from the insoluble matter. CO_2 was passed into the solution, and silvery crystals deposited. This was isolated giving 27 Gm. of a melting point of 152° C. as compared with 150–151.5° observed by Tassinari.

The filtrate was further treated with CO_2 and yielded a tarry substance which was not further investigated.

The SCl_2 was prepared from S_2Cl_2 as follows:

One hundred and thirty-five grams of S_2Cl_2, together with 2 Gm. of "Nuchar," were placed in a flask, and a steady stream of dry chlorine was conducted into the mixture with mechanical stirring and cooling in an ice-salt mixture. The temperature was kept below 3° C., since SCl_2 decomposes at room temperature. When the increase in weight was equal to 71 Gm., the reaction was completed.

Preparation of 3-3'-Diphenyl, 4-4'-Dihydroxy Diphenyl Sulphide.

The method used was as above, using *o*-hydroxy diphenyl instead of phenol.

On distilling off the CS_2 a viscous oil is obtained. Unreacted *o*-hydroxy diphenyl was distilled off *in vacuo* and the residue was dissolved in KOH and treated with CO_2. This yielded a grayish curdy precipitate, which on heating at 110° C., solidifies into a dark, glassy substance, which can be crushed to violet, sticky powder, analyzing too high for sulphur.

The procedure was therefore modified, removing the unreacted *o*-hydroxy diphenyl by steam distillation. The solution remaining in the distillation flask was then extracted with ether, and the solvent evaporated off. The residue was heated for 2 hours at 110° C., and the resultant product was a brown, transparent viscous liquid.

Analysis: Sulphur: Found, 8.20%; calculated for $C_{24}H_{18}SO_2$ 8.62%.

Attempts to further purify this substance by crystallization from solvents were unsuccessful.

Preparation of p-Hydroxy Phenyl Amyl Sulphide.

Potassium methoxy benzene sulphonate which had been prepared from anisol (8) was converted into *p*-methoxy benzene sulphon chloride by reacting with $POCl_3$. The sulphon chloride was reduced to *p*-methoxy thiophenol with tin and hydrochloride acid.

Eight and nine-tenths grams of *p*-methoxy thiophenol were dissolved in 50 cc. of alcohol containing 0.970 Gm. of Na. An alcoholic solution of 6.21 Gm. of *n*-amyl bromide was added. An immediate precipitate of NaBr was formed. The reaction mixture was refluxed on the steam-bath for 3 hours. The alcoholic solution was then filtered from NaBr and upon evaporation of the alcohol, 6.4 Gm. of a light yellow oil were obtained. The yield was 67.8%.

Analysis: Calculated for $C_{12}H_{18}OS$, S, 15.24%; found, S, 15.23%.

Five grams of the above methoxy compound were added to a mixture of 22.6 Gm. of acetic anhydride and 9.9 Gm. of 48% HBr acid. The solution was heated on the steam-bath for 8 hours. Excess HBr acid and acetic anhydride were distilled off *in vacuo*. The oil which remained was dissolved in alkali and the latter solution was extracted with ether to remove undemethylated compound. Acidification of the alkaline solution resulted in precipitation of a black oil. The latter was dissolved in ether and the ethereal solution shaken with charcoal. After filtration the ether was evaporated and the red oil which remained was distilled, the boiling point at 2–3 mm. being 123–130° C.

Analysis: Calcd. for $C_{11}H_{16}OS$, S, 16.23%; found, S, 16.27%.

Preparation of Mono-Acetoxy Mercuri-p-Hydroxy Diphenyl Sulphide.

One gram of *p*-hydroxy diphenyl sulphide prepared by the Grignard reaction was dissolved in 20 cc. of alcohol. The solution was heated on the steam-bath and 1.5 Gm. of mercuric acetate dissolved in 7 cc. of water was added slowly with stirring. The solution was refluxed for one hour when a test with $(NH_4)_2S$ indicated the absence of inorganic mercury. The precipitate formed during the reaction was filtered and purified by dissolving in aqueous alkali and precipitating with acetic acid; 0.1 Gm. of substance was obtained.

The filtrate of the reaction mixture was diluted with water and after saturating with NaCl a gummy mass was obtained. This was treated with alkali and the latter solution acidified. A white precipitate was obtained. The yield was 0.5 Gm.

Analysis: Calc. for $C_{14}H_{12}O_3HgS$, Hg, 43.46%; found, 42.60%.

Mercuration of p-Hydroxy Diphenyl Sulphide as Obtained through Modified Hinsberg Reaction.

Four and eight-tenth grams of *p*-hydroxy diphenyl sulphide were dissolved in 100 cc. of absolute alcohol and heated under reflux with stirring. A solution of 4.9 Gm. of mercuric acetate in 50.0 cc. of 70% alcohol was added dropwise. The solution was refluxed for one hour at the end of which time the test for inorganic mercury was negative. The alcoholic solution was decanted from the precipitate formed during the mercuration and the filtrate was made just acid; the resulting precipitate was filtered, washed with alcohol and dried *in vacuo*.

Yield, 1.2 Gm. Analysis: Calcd. for $C_{14}H_{12}O_3HgS$, S, 6.93%; found, S 5.50%.

The precipitate from which the original reaction mixture was decanted was dissolved in glacial acetic acid and alcohol and treated with NaOH until the solution was just acid. The white precipitate was filtered, washed with alcohol and dried *in vacuo*.

Yield, 0.85 Gm. Analysis: Calcd. for $C_{14}H_{12}O_3HgS$, S, 6.93%; found, 5.40%.

Evidently the products were alike and were a mixture of mono- and di-acetoxy mercuri *p*-hydroxy diphenyl sulphide.

A mercury analysis was made on the compound obtained.

Calcd. for $C_{14}H_{12}O_3HgS$, Hg, 43.55%; found, Hg, 51.2%.

The high mercury assay checks the low sulphur determination in that both are indicative of the presence of 40% of the mono and 60% of the di-mercury compound.

Preparation of Diacetoxy Mercury Para Hydroxy Diphenyl Sulphide.

The method employed above was followed. Six grams of *p*-hydroxy diphenyl sulphide were reacted with 8.6 grams of mercuric acetate in 5% alcohol. Four and three-tenths grams of a white power were isolated.

Analyses: Calcd. for $C_{16}H_{14}O_6Hg_2S$, Hg, 4.40%; found, Hg, 4.70%, 4.64%.

Preparation of 3-3'-Diacetoxy Mercuri, 4-4'-Dihydroxy Diphenyl Sulphide.

Five grams of 4-4'-dihydroxy diphenyl sulphide were dissolved in 70 cc. of alcohol and a solution of 14.6 Gm. of mercury acetate in 80 cc. of water acidified with acetic acid was added all at once. The reaction mixture was heated on the steam-bath with stirring for $^1/_2$ hour, and a yellow heavy precipitate appeared. This was filtered off, washed and dried. The dry compound turned black in color. It was purified by redissolving in alkali and reprecipitating with acetic acid several times. A light colored substance was finally obtained weighing 2.0 Gm.

Analyses: Sulphur: Found, 4.16%; calculated 4.35%
Mercury: Found, 55.00%; calculated 54.60%
for $C_{16}H_{12}O_6SHg_2$.

Preparation of Mono-Mercurated 4-Hydroxy-2-Methyl-Diphenyl Sulphide.

In this experiment the procedure employed in the previous mercurations was followed, using 3.2 Gm. of sulphide and 4.79 Gm. of mercuric acetate.

Analysis: Calculated for $C_{13}H_{14}O_3HgS$, S, 7.01%; found, S, 6.74%.

Preparation of 4-Hydroxy-3-Carboxy Diphenyl Sulphide.

The Hinsberg reaction was used in the synthesis of this compound. Thirty-two and five-tenths grams of benzene sulphinic acid were reacted with 13.0 Gm. of salicylic acid. The mixture was heated for $4^1/_2$ hours. It was then extracted with hot water which removed all constituents except the sulphide. Six and six-tenths grams of crude compound were obtained; yield 28.4%. By distillation of the substance we obtained 2.3 Gm. of crystalline material boiling between 162–167° at 3–4 mm.

Analysis: Calculated for $C_{13}H_{10}O_3S$, S, 13.0%. Calculated for $C_{13}H_{10}O_3S_2$, S, 23.0%; found, S, 15.3%.

Evidently a mixture of 83.0% of monosulphide and 17.0% of disulphide had been formed.

Preparation of 4-Hydroxy-3-Nitro-Diphenyl Disulphide by Means of the Hinsberg Reaction.

From 27.0 Gm. of *o*-nitro phenol 14.0 Gm. of product were obtained, corresponding to a 30% yield. It was distilled *in vacuo;* the fraction boiling between 175–181° at 5 mm. was collected. The compound was a greenish yellow oil.

Analysis: Calcd. for $C_{12}H_9O_3NS_2$, S, 22.9%; found, S, 22.0%.

Preparation of 4-Hydroxy-3-Brom Diphenyl Disulphide by the Hinsberg Reaction.

In this experiment we expected to prepare 4-hydroxy-3-brom diphenyl sulphide from *o*-brom phenol and benzene sulphinic acid. However, analysis of the reaction product indicated it to be the disulphide.

The yield was 26.5% and the boiling point of the disulphide was 173–179° at 3–4 mm.
Analysis: Calcd. for $C_{12}H_9OBrS_2$, S, 20.9%; found, S, 21.7%.

Preparation of 4-Hydroxy-3-Phenyl Diphenyl Disulphide by the Hinsberg Reaction.

We expected to obtain 4-hydroxy-3-phenyl diphenyl sulphide from *o*-hydroxy diphenyl and benzene sulphinic acid. However, analysis showed the product to be a disulphide.

Analysis: Calcd. for $C_{18}H_{14}OS_2$, S, 20.66%; found, S, 21.1%.

CONCLUSIONS.

1. A number of aryl phenolic sulphides have been prepared, as well as some mercury derivatives of some of them, and their germicidal activity has been studied.

2. The introduction of a methyl group into the ring containing the hydroxyl group in *p*-hydroxy diphenyl sulphide decreases the typhoid activity and increases the staphylococcus activity; this is most pronounced when the methyl group is ortho to the hydroxyl.

3. The introduction of an ethyl instead of a methyl group in that ring causes a general rise in germicidal activity for both types of bacilli, giving rise to the assumption that germicidal activity can be still further increased with an increase in the size of the alkyl group.

4. The symmetrical dihydroxy diphenyl sulphides have only low germicidal activity.

5. The mercury derivatives of the aryl phenolic sulphides have no higher germicidal activity than the compounds from which they are derived. The di-mercury compounds are less active than the mono-mercury compounds.

6. The ether derivatives of aryl phenolic sulphides have very low germicidal activity showing that the sulphur linkage alone is not the cause of the high activity of these compounds.

7. Alkyl phenolic sulphides have about the same order of activity as the corresponding aryl compounds.

8. The introduction of the carboxyl group instead of the alkyl group in the ring containing the hydroxyl group in *p*-hydroxy diphenyl sulphide, causes a lowering of germicidal activity.

9. Using the Hinsberg reaction on ortho-nitro phenol, ortho-brom phenol and ortho-hydroxy diphenyl produces the disulphide instead of the sulphide. These disulphides are of a low order of activity.

10. A method of purification of the crude product of the Hinsberg reaction prior to distillation has been developed, which makes it possible to obtain pure products by distillation when phenols of increasing complexity are used.

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RESEARCH DEPARTMENT OF THE CHEMICAL AND
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EXAMINATION OF THE JUICES OF THE LEAVES OF MONARDA PUNCTATA AND MONARDA FISTULOSA.*

BY A. A. HARWOOD.

In order to supplement our knowledge concerning these two plants, it was thought advisable to investigate several physical and chemical characteristics of the freshly expressed juice from the leaves. The leaves were picked and immediately placed in bottles of approximately one-liter capacity with 25 cc. of ether and stoppered securely. The bottles were then placed in a refrigerator over night. The leaves were ground in a food chopper and the sap expressed in a mechanical press. The juice was clarified in a centrifuge and the refractive index determined at 20° C. with an Abbe refractometer.

DETERMINATION OF THE BOUND WATER CONTENT.

The method devised by Newton and Gortner[1] was used for this purpose. The percentage of total solids was obtained by use of the refractive index by consulting the table of Schönrock.[2] The freezing point of the sap was then determined using the ordinary cryoscopic method for this purpose. A sample of the juice was then taken which contained exactly 10 Gm. of water and 0.01 mol. of sugar was added and the freezing point of the sugar solution determined as above. From the data obtained in this manner, the bound water content was calculated using the Newton-Gortner formula for this purpose. The following is a table of the results:

Juice.	Ref. Index.	P. c. Water.	F. P. Sap.	F. P. Sap and Sugar.	Depr.	P. c. Bound Water.
M. fistulosa	1.3437	92.7	−1.03° C.	−3.37° C.	2.34° C.	9.7
M. punctata	1.3437	92.7	−0.91° C.	−3.15° C.	2.24° C.	6.2

A check on the accuracy of the refractive index as a method for the determination of total solids was obtained by evaporating a sample of the sap to constant weight at 60° C. The average results of three samples each of the juices of the leaves of the two plants are as follows: 92.2 p. c. water in the case of *M. punctata*

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* From the Laboratory of Edward Kremers.

[1] R. Newton and A. G. Gortner, *Bot. Gaz.*, 74 (1922), 442.

[2] "Off. & Tent. Methods of Analysis," *A. O. A. C.*, 3rd Edition, page 510.

and 92.8 p. c. for *M. fistulosa*, checking closely with the results obtained by means of the refractive index.

ASH CONTENT OF THE LEAF JUICES.

For this purpose, an indefinite amount of the sap was evaporated under identical conditions as in the case of the determination of the total solids, and a weighed sample subjected to the usual procedure for ash determination. The results are as follows (calculated to the basis of the sap):

Monarda Punctata.

	I. P. c.	II. P. c.	III. P. c.
Water-soluble ash	0.49	0.49	0.50
Water-insoluble ash	0.92	0.92	0.93
Total ash	1.41	1.41	1.43
The water-insoluble ash resolved into:			
	P. c.	P. c.	P. c.
Acid-soluble ash	0.90	0.90	0.90
Acid-insoluble ash	0.02	0.02	0.03

Monarda Fistulosa.

	P. c.	P. c.	P. c.
Water-soluble ash	0.74	0.73	0.81
Water-insoluble ash	0.72	0.74	0.72
Total ash	1.46	1.47	1.53
The water-insoluble ash resolved into:			
	P. c.	P. c.	P. c.
Acid-soluble ash	0.70	0.73	0.71
Acid-insoluble ash	0.02	0.009	0.009

SUGAR CONTENT OF THE SAP.

The reducing and invert sugar content of the sap was determined by the method of Dunlap.[1] The following results were obtained:

	Reducing Sugars.	Invert Sugars.
M. punctata	0.46 p. c.	0.12 p. c.
M. fistulosa	1.39 p. c.	0.01 p. c.

SUMMARY.

(1) Comparative results of the bound water content of the juices of leaves of *Monarda punctata* and *Monarda fistulosa* were obtained.

(2) The ash content of the residue of the juices and the reducing and invert sugar content of the juices were determined.

[1] A. A. Dunlap, *Am. J. Bot.*, 18 (1931), 328.

State Associations and other organizations entitled to representation should not overlook the appointment of delegates to the House of Delegates, A. PH. A., the Conference of Pharmaceutical Secretaries and Conference of Pharmaceutical Law Enforcement Officials—Toronto, Canada, during the week of August 22nd.

A STUDY OF THE INCOMPATABILITY OF CHLORAL HYDRATE AND ALCOHOL IN THE PRESENCE OF SOLUBLE SALTS.

BY GEORGE W. HARGREAVES.

The incompatibility of chloral hydrate and alcohol has long been recognized; however, the literature on this subject is quite meager. It is stated in the United States Dispensatory (1) that hydro-alcoholic solutions of chloral hydrate in the presence of bromides or other saline ingredients frequently show a separation into two layers, the upper of which contains part of the alcohol and all of the chloral. This statement is only partly correct, because it was found in this study that all of the chloral hydrate is not separated out in one layer, in all cases. Furthermore, whether the layer containing chloral is the upper or lower one is determined by the particular concentration of the solution under consideration. The only study of any importance was carried out, in 1885, by Markoe (2) who concluded that the separation in the following prescription was due to the formation of chloral alcoholate:

Potassium Bromide Chloral Hydrate	of each 3 drachms
Camphorated Tincture of Opium Syrup of Ginger	of each 1½ fluidounces

He also found that beside potassium bromide, the addition of sodium bromide, sodium chloride and magnesium sulphate to strong solutions of chloral hydrate together with alcohol determined the separation of the liquid into two layers. In his article no specific examples are given of the above cases and the same is true of his additional observations that ammonium bromide, calcium bromide, ammonium chloride and potassium nitrate fail to disturb the same chloral hydrate solutions.

Ruddiman (3) gives the following prescription as an example of this type of incompatibility:

Chloral Hydrate	4 drachms
Potassium Bromide	3 drachms
Elixir	sufficient quantity to make 2 ounces

The combination of bromides with chloral hydrate is recommended by various authorities on pharmacology and therapeutics such as Sollman (4) and Solis-Cohen (5).

A proprietary preparation is said to contain the following:

Alcohol	10%	To each fluidounce
Chloral Hydrate	91 grs.	
Potassium Bromide	91 grs.	
Cannabis, soluble extract	1 gr.	
Hyoscyamus, soluble extract	1 gr.	

This corresponds in composition and strength to the N. F. preparation Compound Mixture of Chloral and Potassium Bromide; the latter, however, being non-alcoholic.

This investigation was undertaken in an endeavor to determine the nature of the reaction and some of the conditions affecting it.

While this study was being made, the writer had occasion to compound the following prescription in the college dispensary.

Chloral Hydrate	2 drachms
Sodium Bromide	4 drachms
Elixir Lactated Pepsin	sufficient to make 2 ounces

The elixir contains 15 per cent of alcohol. Shortly after mixing the above ingredients, an oily layer separated on the surface. This was colored a very deep red and had evidently taken up some of the coloring matter from the elixir. The physician, upon being consulted, ordered it dispensed with a "shake well" label and stated that he had been using this mixture for several years with much success.

EXPERIMENTAL.

Preliminary.—The prescription given by Ruddiman was used as the basis of some preliminary tests, 20 per cent of alcohol by volume being substituted for the elixir. It gave a clear solution at first which after standing a few minutes became turbid and, finally, an oily layer, having a volume of about 10 cc. separated at the bottom. The lower layer was separated off and found to be quite soluble in both alcohol and water. The aqueous layer on being shaken with an additional quantity of potassium bromide, gave an additional quantity of oil which separated on the surface.

Upon compounding again and substituting distilled water for the 20% alcohol a clear solution was obtained which did not separate even upon standing several days.

Another trial was made without the bromide and a stable clear solution resulted.

Substitution of sodium chloride likewise caused separation. This indicated that the rôle of the saline ingredient is to cause the "salting out" of the oily substance.

Composition of the Oily Layer.—For determination of the composition of the oily layer the mixture was made up in a double quantity, the oily layer separated and taken up in ether. After drying over anhydrous sodium sulphate, the ether was distilled off and the residue fractionated. First a small fraction of alcohol came over, then a fraction of chloral and finally chloral alcoholate which was identified by its boiling point (115°), melting point (46°) and its action with nitric acid. A small amount of crystalline solid remained in the distilling flask and this was identified as potassium bromide.

Another sample was prepared and the oily layer collected and dried as above. Instead of distillation, however, it was allowed to stand in an evaporating dish over night. There resulted a crystalline mass of chloral alcoholate together with an oily liquid which was identified as chloral.

It is expected to study this reaction later from a quantitative standpoint.

Conditions of Separation.—In order to study the effect of concentration on the reaction, a series of samples of various alcoholic strengths and concentrations of both chloral hydrate and potassium bromide were compounded. The results are given in the following tables.

TABLE I.

No.	Chloral Hydrate.	KBr.	Alcohol % q. s. ℥ii.	Result.
1	2 drachms	4 drachms	10	No separation
2	2 drachms	4 drachms	20	Separation
3	2 drachms	4 drachms	30	Separation
4	2 drachms	4 drachms	40	Separation
5	2 drachms	4 drachms	50	No separation

Table II.—Nos. 1–5; Chloral hydrate, 3 drachms; Potassium bromide, 4 drachms; Alcohol, consecutively by tens in percentage (Alcohol % q. s. ℥ii—this applies to all alcohol employed)—10, 20, 30, 40, 50 as first table; separation occurred in all solutions, except first—10 per cent.

Table III.—Nos. 1–5; Chloral hydrate, 4 drachms; Potassium bromide, 4 drachms; separation occurred in all except first.

Table IV.—Nos. 1–5; Chloral hydrate, 4 drachms; Potassium bromide, 3 drachms; Alcohol, by tens in percentage as first table; same results as Table I.

Table V.—Nos. 1–5; Chloral hydrate, 3 drachms; Potassium bromide, 3 drachms; Alcohol by tens in percentage as first table; separation occurred in none of the solutions.

EFFECT OF SUGAR ON THE "SALTING OUT" PROCESS.

The results in Table V would indicate that there should be no separation in the prescription given by Markoe. It was found that upon compounding the following mixture:

Chloral Hydrate		Chloral Hydrate	℥iii
Potassium Bromide	aa ℥i	Potassium Bromide	℥ii
Diluted alcohol		Syrup	
Syrup	aa q.s. ℥i	Alcohol 40%	aa q. s. ℥ii

an oily layer separated. Evidently the sugar also affects the salting out process. In another trial separation was quite rapid in the following:

All the above results were duplicated using sodium bromide. Ammonium bromide and calcium bromide were tested according to Table IV and gave analogous results.

DISCUSSION OF RESULTS.

In Table V, numbers 2, 3 and 4, what might be termed a "critical concentration" is reached. The addition of a small quantity of either chloral hydrate or potassium bromide to these samples will cause separation. With a low concentration of alcohol either the reaction does not take place or not enough chloral and chloral alcoholate are formed to be thrown out of solution. With 40% and 50% alcohol and a concentration of two drachms of potassium bromide to the fluidounce, part of the bromide is insoluble.

SUMMARY.

1. Separation in hydro-alcoholic solutions of chloral hydrate with soluble salts is affected by the concentration of chloral hydrate, alcohol and salt.

2. The conditions of separation are given for the concentrations which might be met with in dispensing.

3. Sugar affects the salting out process, making a smaller amount of salt necessary to cause separation.

4. The oily layer was found to consist of alcohol, chloral, chloral alcoholate and a small quantity of dissolved salt.

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ALABAMA POLYTECHNIC INSTITUTE,
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CHEMICAL STUDIES OF THE FRESH JUICE OF THE MAGUEY PLANT.—(MANSO FINO, KARW).

(*Continued from page 356, April number, Jour. A. Ph. A.*)

A PRELIMINARY REPORT.

BY HERMAN D. JONES.*

PAPER NO. 2.

METHOD OF OBTAINING THE OILS AND CRYSTALS.

There has been found in the aguamiel an oil which doubtless gives to the maguey its characteristic odor, since on being extracted, the oil has the same odor as the maguey or the fresh juice, except that it is more pronounced. It is present in large quantities in the leaves and in small quantities in the finished syrup.

The dry maguey leaves were powdered and passed through a 40-mesh sieve to remove fibre and to assure good exposure to the solvent or extract the oil. Four kilos of this powder were extracted with sulphuric ether for 24 hours. As the ether became saturated with the oils, they were precipitated in the flask. When extraction was complete, the ether and extract were placed in an 8-liter flask and sufficient ether added to bring all the oils into solution. This was then filtered and this ether solution treated with twice its volume of petroleum ether. A small quantity of a cream-colored compound was precipitated, removed by filtering and set aside for further study. The petroleum ether was next removed by distillation on water-bath under vacuum. The volume was reduced to approximately the same as the original solution, when it was treated with twice its volume of methyl alcohol. Of the three distinct layers which appeared, the thin dark, oily ones at the bottom and top were separated and set aside for further study. The remaining bulky, light layer was placed in a still and the ether and alcohol removed under vacuum until the volume of heavy, oily solution was quite small. This residue was allowed to stand in an evaporating dish without heat for several weeks until no alcohol odor was perceptible. Then on inspection there appeared many white, glistening crystals whose physical properties appear below.

PHYSICAL PROPERTIES.

Color—white. Odor and taste—none.
Structure—crystalline, very thin parallelogram.
Ignition test—burns with smoky flame without residue.

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* From the Department of Biological Chemistry, Alabama Polytechnic Institute, Auburn Alabama.

M. p.—237° to 240°; turns brown on melting.

Extinction angle—90°; polarizes light.

Solubility.—Slightly soluble in acetone, ether, cold methyl and ethyl alcohol; easily soluble in hot methyl and ethyl alcohol, hot glacial acetic acid, concentrated H_2SO_4, turning red after standing: insoluble in hot and cold dilute and concentrated alkali, hot and cold dilute and concentrated HCl, and concentrated HNO_3 and in cold H_2O.

Chemical Tests.—Element tests—nitrogen, sulphur, phosphorus and halides negative.

Does not give acid test by titration method with phenolsulphone phthalein as indicator and *N*/50 NaOH.

Does not decolorize bromine water nor Br in CCl_4.

Does not react with $FeCl_3$.

When taken up in hot alcohol and treated with chloroplatinic acid, an amorphous precipitate was obtained, later forming rosette-like crystals.

When taken up in alcohol, does not react with Mayer's nor Wagner's reagent.

Test for Aldehyde Group.—When taken up in hot acetic acid and treated with phenol hydrazine, a precipitate is obtained. A control run at the same time on the acetic acid minus the substance gave no precipitate.

Test with Aldehyde.—Free methyl alcohol and fuchsine solution-positive. Blank test on alcohol also gave faint positive test but showed up less readily than solution containing the substance.

Test with $AgNO_3$ and NH_4OH.—No reduction.

Combustion Analysis.—Found to contain 63.1% C, 9.3% H, 27.6% O, giving empirical formula C_3H_6O, with weight 57.

An effort is now being made to determine the molecular weight and structure of this substance.

THE CHINESE PHARMACOPŒIA.

In preparing this review the *China Medical Journal*, the *Eastern Druggist* and *Japanese Retail Druggist* are drawn upon, and the volume under review, copy of which has been donated to the ASSOCIATION. The volume, contains nearly 700 headings and about 280 are galenical preparations. The official title is given in Chinese; the Latin title, in most instances, is like that of the U. S. P., when it is an official of that standard; the British and German Pharmacopœia are also given recognition; an abbreviated form is also included and the chemical formulas and molecular weights. Many of the tests given are based on the Japanese Pharmacopœia; methods for biological assays are included.

Provisions should be made for the next edition and the plan for revision might follow that of the U. S. Pharmacopœia. China, evidently, has need for a Pharmacopœia and it is safe to say that the present edition will be helpful in correcting the condition of medical and pharmaceutical practice and incidentally the market of non-official drugs and chemicals. In order to carry forward this important work a group of pharmacists is needed who will devote themselves to it with a purpose of improving the materia medica and study the form in which they may be best represented in the pharmaceutical preparations. A forward step has been taken in the production of this Pharmacopœia and the revisions should follow General Principles, formulated by groups who are benefited by the standardization. China, naturally, has problems that differ from those of other countries and in some respects more difficult than ours.

The copy of the "Chinese Pharmacopœia" has been donated by the National Health Administration through the courtesy of our fellow-member, S. Y. Chen.

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HERBARIA AT KEW, ENGLAND.

There has been considerable activity at Kew during the past year on Chinese material. A large number of living specimens have been received from China for identification. Further progress has been made with the naming of Captain Ward's collection from Upper Burma, which necessitated investigations of a number of genera, especially *Aconitum*, *Dentella* and *Leycesteria*. Important contributions were received from Singapore, Malay States, British North Borneo, Madras and Assam. Many specimens from Malay Archipelago and Phillipine Islands remain to be incorporated in the Herbarium.

THE SOLVENT EXTRACTION OF CASTOR OIL SEEDS.

BY MARGARET C. SWISHER AND GEORGE W. FIERO.

Castor oil seeds consist of about 23–35% seed coats that are rich in mineral matter and low in oil (10%), and 65–75% of kernel. The kernel is made up of about 46% fixed oil, 2.3% gum, 20% starch, albuminoids, lignin, etc. Ricinolein makes up the greater part of the fixed oil. Also found in the kernel are small amounts of (*a*) ricin, a very poisonous toxalbumin insoluble in alcohol and precipitable with steam, (*b*) ricinine, a non-toxic, basic substance soluble in the organic solvents and volatile with steam and (*c*) a powerful, fat-splitting enzyme that hastens the hydrolysis of the oil after the seed coats are broken. The fixed oil is the main commercial product. However, only a small fraction of the supply is used in medicine, the major portion being used as a lubricant in motors, and in the manufacture of artificial leather.

The present method for the commercial preparation of castor oil consists of pressing the seeds and extracting the cake. By this means seeds that contain 45% oil will yield about 30–34% of a No. 1 oil by expression, and 9.5–15% of a No. 3 oil by extraction; thus leaving 0.6–2% of the oil in the pomace. The solvent extracted oil is not used for medicinal purposes.

There has been a strong prejudice against solvent-extracted oils. They are said to be inferior in quality, darker in color, higher in acidity and to retain small amounts of the solvent. The French are said to have used solvent extraction for the preparation of their oil, but found that the product became rancid more rapidly than the expressed oils. Many different solvents have been used previously for castor oil extraction. Farbenind (1) claims that chloroform, carbon tetrachloride and methylene chloride alone and when mixed with benzene are very good solvents. Slashchev (2) found that benzene darkened the oil. Shrader (3) reports that he extracted a No. 1 oil from the seeds using benzene. Although the oil was a greenish color, he thought that it could be decolorized. Perin (4) found acetone to be very valuable because its greater affinity for water than for the oil made it possible to remove the solvent by treating the mixture with water. Shrader (3) states that gasoline yields a yellow oil, while methyl acetate, methyl ethyl ketone, acetone and ethyl yield red oils.

EXPERIMENTAL.

TABLE I.

Solvent.	Yield.	Efficiency.*	Color of Oil.
Petroleum ether	6.5%	14%	Yellow
Benzene	13.3%	28%	Yellow
Ethyl ether	15.4%	34%	Light yellow
Acetone	22.8%	50%	Light yellow
Toluene	23.0%	51%	Red
Alcohol	42.0%	93%	Yellow

* The total content of the beans was 45.21%.

In order to ascertain the relative merits of several organic solvents for castor oil extraction, 150-Gm. samples of the seeds were percolated with 500 cc. of the solvent. Care was taken that the rate of percolation be kept as nearly uniform

as possible. The solvent was removed at reduced pressure. The relative efficiency of the various solvents is shown in Table I.

To be satisfactory a solvent must (*a*) remove the maximum percentage of oil, (*b*) remove the minimum amounts of impurities (such as gums, coloring matter, albumins—especially ricin), (*c*) be sufficiently volatile to be removed easily and completely at low temperatures and (*d*) cheap enough so that the loss from volatilization will make its use practical on a commercial scale. We found that a mixture of methanol and ethanol met each of these requirements.

The seeds freed from any foreign particles, were placed in an ice box over night or until they had reached a temperature of 5° C. This makes the seeds more brittle, minimizes expression of the oil when they are run through the grinder, and lessens the action of the lipase on the oil. The whole seed was run through the grinder and the product mixed either with a No. 10 previously washed and dried sand, or, with white excelsior previously percolated with the solvent to be used. The material was packed in a two-quart glass percolator and continuous downward percolation used. The time required to remove the oil completely from 1000–1200 Gm. of the seed was twenty to twenty-four hours, and it was necessary to use about four liters of solvent.

The solvent was removed at reduced pressure. When only a few cc. of the solvent remained, a wax-like, amber-colored material settled out on the sides of the container. This waxy material was strained off before purification of the oil. By work now in progress the authors hope to be able to determine the nature and value of this waxy material. The crude castor oil obtained was reddish yellow in color, had a bitter acrid taste and a disagreeable odor.

The oil was deodorized by using steam distillation. After the oil had been treated with twelve times its volume of water (as steam) the disagreeable odor was gone but an acrid taste, irritating to the throat, remained. After the oil had been treated with sixteen to eighteen times its volume of water (as steam) the acrid taste was gone and a faint pleasant nutty odor and taste remained. The steam distillate had a characteristic bitter, nauseating odor. During the steam distillation the small amounts of ricin and ricinine extracted by the solvent were removed or precipitated. The color of the oil was reduced in proportion to the amount of steam passed through the oil. This is shown in Table II.

TABLE II.

Sample.	Water per cc. of Oil.	Color Expressed in mg. I_2 per 100 cc.
The crude oil reddish yellow in color	4.26	151.8
	7.00	115.5
	8.18	97.5
	12.13	56.25
	16.67	24.21

After complete removal of the water from the deodorized oil, it was further decolorized by a mixture of a commercial activated carbon and a commercial clay. It has been found that clays are very effective for removing yellow coloring materials but are much less efficient if red coloring matter is also present. On the other hand the carbons are particularly useful in removing red coloring matter. We found that 5–10% clay and 0.2–2% carbon was much more effective for decolorizing

the oil than greater amounts of either used separately. After the mixture had been heated to 65–75° and stirred with a mechanical stirrer for 30–60 minutes, the product was filtered by suction. A practically colorless oil (pale yellow in two-inch layers), with a faint nut-like odor and taste was obtained. There was no taste and no odor of castor oil, and no irritating action on the throat. The effect of the decolorizing mixture on the acid number is given in Table III.

TABLE III.

Decolorizing Agent.	% Used.	Temp. ° C.	Acid Value, Original.	Acid Value, Final.	Change.
Carbon	2.5	65–75	1.746	1.280	0.466
Carbon	5	65–75	1.746	1.164	0.582
Carbon	1				
Clay	9	65–75	1.746	1.164	0.582
Clay	5	26	1.138	0.980	0.358
Carbon	1				
Clay	4	26	1.138	1.101	0.227

The constants of the deodorized, decolorized, extracted castor oil are compared with the constants of standard oils in Table IV.

TABLE IV.

	U. S. P.	Extracted Oil.
Odor	Faint, mild	Faint, nut-like
Taste	Bland, afterwards slightly acrid and usually nauseating	Pleasant, nut-like free from acrid or nauseating taste
Sp. Gr.	0.945–0.965	0.959 – 0.961
Acidity (cc. 0.1 *N* NaOH)	Not more than 1.5	0.25 – 0.53
Acid value	Not more than 4.2 (calc.)	0.93 – 1.55
Saponification value	178–185	179 – 180
Iodine value	83–88	91 – 96
Refractive index	(1.4783–1.4789, standard)	1.4769–1.4771

Samples of the extracted oil were stored (*a*) at room temperature, (*b*) at 40° C. and (*c*) at 30–35° in the sunlight for periods of eight to fifteen weeks. Those kept in filled bottles at room temperature for thirty weeks, and those kept at 40° for eight weeks (equivalent to room temperature for from one to two years) did not develop a castor oil taste or odor, showed a slight increase in acid number, but practically no change in the other constants. Comparisons made with similarly treated expressed commercial oils indicated that the extracted oil was more stable. Those samples kept in the sunlight at 30–35° developed a disagreeable odor and taste unlike that of castor oil, and showed a decided increase in acidity and in refractive index.

The effect of nitrogen and of carbon dioxide on the preservation of the oil before storage was determined. It was found that carbon dioxide hastened the formation of acid, but nitrogen had some preservative action.

SUMMARY.

1. A practical solvent extraction process which removes 99% of the total oil as a No. 1 oil from castor seeds is described.

2. All of the solvent can be readily removed.

3. The purification process gives an oil that is almost colorless, has a pleasant nut-like odor and taste, has neither an acrid nor a castor oil taste, and meets all of the U. S. P. requirements excepting the iodine value.

4. The decolorizing action of steam on the oil is noted.

5. The removal of some of the acid by the clay and carbon decolorizing mixture is noted.

6. This extracted oil has keeping qualities superior to the commercial expressed oils.

7. The addition of carbon dioxide to bottles of the oil before storing was found to hasten the formation of acid. The addition of nitrogen to the containers before storing had some preservative action.

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President Walter D. Adams and Chairman Anton Hogstad talking over Pharmacy Week matters at Texas Pharmaceutical Association exhibit.

1932 NATIONAL PHARMACY WEEK—OCTOBER 10TH–15TH.

BY ANTON HOGSTAD, JR., *Chairman.*

National Pharmacy Week Executive Committee.

The National Pharmacy Week Executive Committee urges every pharmacist to begin now to make plans for the forthcoming National Pharmacy Week, October 10 to 15, 1932. Plans are well under way for a most successful Pharmacy Week. No doubt we will again be favored with a proclamation from President Hoover, as has been the case for the past few years. The radio broadcast program will be on a much larger scale than ever heretofore.

Don't wait until the last week to plan for that window display. It takes considerable thought and time to prepare a truly worthwhile window display. The Federal Wholesale Druggists' Association, through its secretary, R. E. Lee Williamson, will again donate a beautiful silver loving cup as the Grand Prize; State and local associations will likewise offer loving cups and other prizes for their respective states.

In view of the fact that the map to be supplied by the National Wholesale Druggists' Association, through its secretary, Dr. E. L. Newcomb, is to feature colored illustrations of medicinal plants, according to the respective states, it will be possible to bring into being many interesting window displays dealing with quaint and mysterious herbs. Living medicinal plants, as well as crude drugs, always attract an unusual amount of attention.

The following thoughts are offered at this time for your kind consideration relative to a professional window display:

1. It is generally advisable to select one subject and to stick to it throughout the entire display.
2. A professional window display should not only be attractive in appearance but should carry with it a deep significance.
3. Every display should set forth the title so that the passerby will know at a glance the story which you are to portray.
4. It is very essential that all window displays be dramatized in such a manner as to captivate the imagination of the passerby.

It is further suggested at this time that you get in touch with a local botanist in the event you wish to feature native medicinal plants (in case you are not familiar with field botany). Many Boy Scouts are familiar with native wild flowers. Enlist their support. Many different types of attractive window displays can be brought into being by employing rocks, black dirt, moss, living specimens of medicinal plants, etc., which can be gathered during the course of a pleasant afternoon spent in roaming over the hillsides and down through the woodlands. Many titles to such displays suggest themselves, as:

a. Medicinal Plants of Your State
b. Some Quaint Native Medicinal Plants
c. Drugs of the Scriptures
d. Dyes Used by the North American Indian
e. Drugs of the North American Indian
f. Geography of Medicines
g. Many excellent displays can be brought into being, the pivot of these displays being such drugs as Golden Seal, Ginseng, Sassafras and others.

Rules of Contest.

The following rules should be borne in mind:

1. A professional window display, it has been determined, is a display picturing any subject pertaining to professional pharmacy, pharmaceutical education, legislation, literature, etc.
2. The best professional window display will be selected from photographs taken of windows dressed in accordance with Rule *1* of the Contest, and submitted as follows:

   a. The secretary of each State pharmaceutical association will send in to National Pharmacy Week headquarters, 161 Sixth Avenue, New York, N. Y., the photograph of the best professional window display of his State. He may determine

the best display by a State contest or by some other method which he or his association may select.

b. An exception to rule *2a* will be made for the State of Nevada where there is no State association. The contestants in that State will mail photographs of their windows direct to National Pharmacy Week headquarters, 161 Sixth Avenue, New York, N. Y.

c. With the exception of the State of Nevada, no photographs may be sent direct by contestants to National Pharmacy Week headquarters—they must be sent to the secretaries of the State associations to which the contestant belongs, for competition in the State contests. The secretary of each State association will then mail the winning photograph in his State to National Pharmacy Week headquarters for competition in the National Contest.

d. The District of Columbia will be considered as a State association and the secretary of its pharmaceutical association will submit the winning photograph to National Pharmacy Week headquarters to be entered in the National Pharmacy Week window contest.

3. Photographs submitted must show the entire window. The photographs must be large enough so that details of display will be plainly shown and, although no definite restrictions are made, it can hardly be expected that this could be accomplished in a photograph smaller than 5″ x 7″; 8″ x 10″ being the ideal size.

4. Competing windows must be non-commercial although manufactured pharmaceutical, chemical and biological products which are related to the practice of professional pharmacy may be displayed. Merchandise unrelated to professional pharmacy must not be displayed. Price tags must not be used.

5. No photographs will be accepted as eligible for the National Pharmacy Week Window Contest if postmarked later than midnight of December 1, 1932.

6. The winner of the 1932 contest will be decided by a committee of five judges, consisting of prominent pharmaceutical figures from the city of Boston.

7. Announcement of award of the championship trophy will be made through the pharmaceutical journals of the nation and the silver cup will be formally presented to the winner.

IOWA PHARMACISTS' EXHIBIT AT IOWA MEDICAL ASSOCIATION.

The following letter, in part, was placed in the hands of members of Iowa Pharmaceutical Association:

"May we cordially invite you to visit the display of UNITED STATES PHARMACOPŒIA and NATIONAL FORMULARY preparations at your convention. This display is sponsored by the Iowa Pharmaceutical Association. . . .

"Products of the U. S. P. and N. F. recommend themselves to your prescription use. The official preparations lend character to prescriptions. This is a fact, because they:

1. May be personally adapted to the patients' prescriptions need.
2. Are a significant saving to the patients as compared to high-priced specialties.
3. Militate self-medication.

"We will have at this display booth samples of official preparations, which you may have for the asking. There will be pharmacists in attendance to answer questions regarding U. S. P. and N. F.

(Signed) SIOUX CITY PHARMACEUTICAL ASSOCIATION—Committee on U. S. P. and N. F."

The illustration herewith shows the exhibit at the Iowa Pharmaceutical Association of U. S. P. and N. F. Preparations, at the annual meeting of the Iowa Medical Association, held in Sioux City, May 4th to 6th.

This display was held to sponsor a closer coöperation between the two Associations, and to make the physicians of Iowa better acquainted with the Materia Medica of the U. S. P. and N. F.

The exhibit was arranged in the Scientific Exhibitors' Section, at the Masonic Temple

where the meeting was held. Geo. Judisch, of Ames, was in charge, assisted by Lee Coy, of Cedar Rapids; John Berg, of Cedar Falls; and N. P. Bogan, of Sioux City.

The exhibit consisted of the following: Seventeen of the most familiar U. S. P. and N. F. products; British, German and U. S. Pharmacopœias; a group of reference books for pharmacists, consisting of Remington's Practice of Pharmacy, U. S. Dispensatory, Merck's Index and The Pharmaceutical Recipe Book. Cards—with the headings—"These Are OUR Books—Let Us Use Them," "Materia Medica of Merit," "Official Preparations Have Known Composition"—were used to call attention to the usefulness of the U. S. P. and N. F.

Each physician visiting the exhibit was given two pamphlets: one, describing the products on display and the other containing "Some Notes on Syrups and Elixirs of the N. F. V."

Iowa Pharmaceutical Association exhibit at the Iowa Medical Association meeting.

The expedience of U. S. P. and N. F. products was brought to the attention of everyone visiting the exhibit by concrete examples and comparisons with widely advertised products.

There were many interesting questions asked by the physicians, which indicated a desire for better acquaintance with U. S. P. and N. F. preparations.

One question asked by a visiting physician is especially notable. It shows a desire on his part for a better coöperation. He said he would like to know how he could locate a desirable pharmacist to open a store in his town. His name and address was given to Dean Teeters, of the University College of Pharmacy, and to Walter F. Meads, Secretary of the State Board of Pharmacy.

We feel that this exhibit and meeting with the physicians of Iowa on a common ground is a step in the direction of a closer coöperation between the two professions—to achieve success it must be followed by conscientious effort on the part of every pharmacist in the state.

FRATER WILHELM BODEMANN BROADCASTS.

During the annual meeting of the Texas Veteran Druggists' Association, held in conjunction with the Texas Pharmaceutical Association convention, in Austin during the week of May 16th, the voices of Wilhelm Bodemann and E. von Hermann, the permanent recording and corresponding secretaries, respectively, of the C. V. D. A., were heard. At the request of Walter D. Adams

of the Texas Association, the remarks of the two widely known veterans were recorded by the Lyon & Healy Company of Chicago and the record forwarded to Secretary Adams. The message contained in the record follows:

"Dear Walt:

The good book says, 'Wheresoever two or three are gathered in my name, I will be amongst them,' and the C. V. D. A. says, 'Wheresoever veteran druggists are gathering, the members of the C. V. D. A. are amongst them in spirit.' That is why the C. V. D. A. by unanimous vote ordered me to send you this greeting, as per your request, for the Texas Pharmaceutical Association's veterans meeting.

We pharmacists have a legion of associations. I will speak of the three most conspicuous ones. The N. A. R. D. takes care of the slogan 'Live and Help to Live' and our frater, Sam Henry, is the master mechanic of that great association. The educators have an organization with the slogan, 'Raise the Standard' and another C. V. D. A. frater—W. B. Day—is at the helm. As long as I can remember the standard has been raised so long that it ought to be up in the skies so high that it would take a Lick telescope to see the tail end of the blessed thing.

Now comes veteran druggists' associations. Their slogan is 'Friendship, fraternal love, humanity, a lofty ideal.'

T. N. Jamieson's brain, heart and purse founded the C. V. D. A. and all other veteran druggists' associations and you should pay homage to his memory whenever you meet.

Should I go into details about our minute man, Theophilus Schmidt, it would break the record of this record. If every veteran druggists' association had such an expert the cause would enhance by leaps and spread the gospel of veteranism.

We have now twenty-seven veteran druggists' associations in our country and I am glad that Texas is one of the most enthusiastic. You will please convey the best wishes and greetings to the Lone Star veterans of the parent organization. We are proud of our children.

With kindest personal regards to you, dear Walter,

Your friend,

WILHELM BODEMANN,
Recording Secretary, C. D. V. A."

"I most sincerely indorse and approve what Recording Secretary Bodemann said and will add that at our meetings we prohibit discussions of politics, religion and business, just indulge in reminiscence of days gone by and celebrate birthdays, initiated by our honorary president, John Blocki.

E. VON HERMANN,
Corresponding Secretary, C. D. V. A."

COMMERCIAL HAND BOOK OF THE NETHERLANDS.

According to Philip C. Coote, in the *Commercial Hand Book of the Netherlands*, East Indies, Netherlands, India, the Netherlands claims to be the most important producer of quinine, about 96% of the bark coming from Java.

The cinchona industry is, to a very great extent, in the hands of the Kina Bureau Combine which controls the bulk of the estates, and is under contract to sell the produce to the Bandoengsche Kinine Fabriek at Bandoeng. The output and marketing of the product of the cinchona tree is, therefore, in the hands, to a very great extent, of a powerful combine. British capital is also considerably interested in the industry, and the British Combine of Cinchona Planters, which controls a wide area of plantations, sells direct to a manufacturer in Great Britain. There are also some cinchona plantations in Sumatra in which Japanese capital is interested. There are some 141 cinchona plantations, for which 25 are solely devoted to the culture of the drug.

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor will also undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

ADVERTISING AND SELLING PROBLEMS OF DRUG STORES.

PERSONAL SALESMANSHIP IN DRUG STORES.

BY PAUL C. OLSEN.

Sales in drug stores are of three general types, depending upon whether or not choice is involved in the purchase, and upon suggestion. An example of a purchase in which choice is infrequently involved is a tooth paste. In such cases, the customer usually has decided before ever she enters the store that she needs tooth paste and is going to buy it. Most druggists have observed, too, that she has decided on the brand which she will buy.

Sometimes it is said that in such purchases that the salesperson is little more than a cashier whose function is to receive the money, make change and wrap and deliver the package to the waiting customer.

Even in such cases, however, there is opportunity for the salesperson to employ skilfully many of the characteristics of successful personal salesmanship. The objective is, of course, to make the customer so pleased with the reception and service she has received that she will continue to make purchases in the future at that particular store.

This is of the greatest importance in all drug stores because, even in the so-called transient stores, the bulk of the business comes from a relatively small number of people to whom that store is more accessible and more convenient than any other drug store. This is true to even a greater degree, of course, in city neighborhood drug stores and in drug stores in communities of small population.

An example of a sale involving choice is a stationery purchase. The customer says, for instance, he would like some correspondence cards or he would like a notebook or other stationery for a special purpose. A selection must be made by the customer with the skilful assistance of the salesman. Other types of merchandise in which choice is frequently involved are cameras, bristle goods, rubber goods and perfumes.

A type of sale often employed in some drug stores is that in which suggestion is involved. This is the so-called companion sale. A customer makes a purchase upon which she has decided before she enters the store. Then the salesperson suggests to her additional purchases which appear logical in view of her original purchase. The tooth paste purchaser, for example, is asked to buy a tooth brush

*Lecturer on Business, Columbia University and Philadelphia College of Pharmacy and Science.

and, perhaps, mouth wash. Sometimes the suggested sale is of a totally unrelated item. The justification for calling such an item to the attention of a customer after she had made an original purchase is the special value offered by the suggested item.

Consider first the personal characteristics which are vital to the success of a drug store salesman in the case of merchandise in which choice is not often involved. He should know where the goods called for are in the store, so that he can find them without delay to himself and to the waiting customer. I have observed many drug stores in which unnecessarily large sales forces are employed with consequent high salary costs simply because the merchandise for sale is so disordered and poorly arranged that salespeople must spend a large part of their time looking for items called for by customers.

A further aid to drug store profits is a knowledge by salespeople and an arrangement of the stock so that he can sell, first, the merchandise which has been in stock the longest. I have observed many times when merchandise is placed on the shelves in a drug store that the new stock is placed in front of the stock of the same item already there.

It is natural for a sales person trying to wait on a customer quickly to take the item which is easiest to reach. When stock of an item has been replenished several times, it is not hard to see that on the back of the shelf will be two or three or four of that item which have been there indefinitely.

This increases the likelihood of this slow-moving part of the stock becoming shop-worn, damaged or deteriorated. The net profits from the sale of a dozen of many drug store items are so small that if even one-twelfth of that dozen becomes so shop-worn that it cannot be sold, *the result is likely to be no net profits from the sale of the entire dozen.*

For instance, a druggist buys a quarter dozen at a time of a 50-cent item. He pays $1 for the quarter dozen. He reorders each time he observes the stock of that item to be reduced to one-twelfth dozen. For four quarter dozen orders he thus has paid $4 and should receive from their sale, $6. Assume that the cost of making each sale is 13 cents, of which 8 cents is the actual cost of waiting on the customer and handing the merchandise to him and 5 cents is the cost of keeping the merchandise in the store ready for sale.

Now suppose that as these replacements of stock are made, a quarter of a dozen at a time, the twelfth dozen remaining in stock is pushed back further and further and not sold until it is so shop-worn that it cannot be sold.

Carrying costs on the dozen used here as an example are twelve times 5 cents, or 60 cents. Selling costs on the eleven sold are eleven times 8 cents, or 88 cents, a total of $1.48. For merchandise which has cost this druggist $4, he is receiving from the sale of eleven of that item, $5.50, leaving him a gross profit of $1.50, from which to pay carrying and selling costs of $1.48, or a net profit of 2 cents on the eleven transactions. This is less than one-fifth of a cent net profit on each item sold.

On the other hand, if the druggist had sold the entire twelve, instead of allowing one of that twelve to be pushed back and become so shop-worn it could not be sold, he would have received $6 for the merchandise for which he paid $4, a gross profit of $2. Carrying costs on the twelve items would have been twelve times

5 cents, or 60 cents and selling costs twelve times 8 cents, or 96 cents, a total of $1.56.

With a gross profit of $2 and expenses of $1.56, his net profit from the sale of a dozen, thus, was 44 cents, twenty-two times as much as was the case when stock was not sold in the order in which it was received. This is one of the most important reasons that many druggists do not earn the profits they should from the operation of their stores. One important characteristic of drug store salespeople should be, therefore, a recognition of the effect of these conditions upon drug store profits; also that most merchandise is subject to the competitive prices of stores in which the overhead is less because of greater volume of sales—the fact points out that development of the professional character of the service, to a certain extent, limits competition to those who have more closely related viewpoints.

Other characteristics vital to successful personal salesmanship in drug stores in any of the three types of sales enumerated before in this article, will be the subject of the next article in this series.

PROFESSIONAL PHARMACY EXHIBIT AT WISCONSIN PHARMACEUTICAL ASSOCIATION.

One of the unique features of the 1932 Wisconsin Pharmaceutical Association Convention will be that of a complete professional pharmacy set-up in the Hotel Schroeder, Milwaukee, Wisconsin, July 12th to 14th. This undertaking is being sponsored by the University of Wisconsin School of Pharmacy, through Dean Edward Kremers, in coöperation with Merck & Co., Inc. The exhibit will include three 15 x 15-foot sections, one section for a modern prescription shop; a second for a library reference room and the third for a reception room. In the prescription shop, the special type prescription desk will be featured. Members of Pharmacy will be engaged in the actual compounding of prescriptions during the convention dates. There will be a nurse in charge of the reception room as well as a number of members of the faculty engaged in library reference work in the library. The audience will be seated in front of this forty-five-foot exhibit space and will be privileged to witness the entire procedure during which times a series of four lectures dealing with professional pharmacy will be delivered by Prof. Anton Hogstad.

The Southwestern Bell Telephone Company is coöperating to the extent of installing a modern switchboard with a number of trunk lines as well as private lines. One or two of these private lines will be extended to places in the audience so that the pharmacists and physicians in attendance will be privileged to telephone in prescriptions and then to actually witness the entire procedure.

RESOLUTIONS OF TEXAS PHARMACEUTICAL ASSOCIATION.

Texas Pharmaceutical Association adopted resolutions as follows:

In opposition to various forms of increased taxation.

Commending the high standard of excellence of the School of Pharmacy, University of Texas.

Favoring development of a four-year course in pharmacy.

Commending Hon. Clyde Kelly and endorses Capper-Kelly Bill opposing combination deals.

Condemning methods subversive to the principles of Fair Trade practice.

Condemning the practice by the press of referring to narcotic raids, and the like, under the term of "drug." Condemning also similar application in moving pictures.

Endorsing the President's recommendation of county organization work.

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THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

Continuing the discussion of the teaching of Pharmacology and Pharmacognosy begun by Dean Bliss in a recent issue of the JOURNAL, the following papers by Dr. Youngken and Dr. Christensen are worthy of careful study by every teacher of the subject. These papers complete the symposium on the subject conducted by the Teachers' Conference on Materia Medica at the Miami meeting of the Association.—C. B. JORDAN, *Editor.*

WHAT IS PHARMACOGNOSY?

BY HEBER W. YOUNGKEN.

To one who is regularly engaged in the pursuit of the varied problems of this science the first reaction to this question is that the answer is so simple that it could be given within the limit of a three-line paragraph and that any attempt to elaborate the answer into a paper would only be a waste of energy to himself and of time to his audience.

This is what first entered my mind when our chairman requested me to present a 15- to 20-minute paper upon that topic. But further mental reaction reminded me that all was not as lucid as it seemed and that there was an important reason for the chairman's request.

I recalled having heard this same question asked on previous occasions during our conference meetings but no one seemed willing or was bold enough to offer a positive answer. This is, indeed, not surprising if one takes into account that Pharmacognosy is a growing, applied science considerably less than a century old in America, whose workers have even differed among themselves as to the exact limits of its scope.

We might approach a solution by considering the origin of the term, the definitions for it given by authors of the past and present and then take up the problems embraced in its practice of to-day.

The term Pharmacognosy was introduced by C. A. Seydler in his "Analecta pharmacognostica" in 1815, and is formed of two Greek words, φαρμακον, a drug, medicine or remedy and γνῶσις, knowledge, and hence literally means the science or knowledge of drugs.

The dissertation of Seydler was a compilation of the literature on Olibanum, Calumba root and Ammoniacum.

The term Pharmacognosy was early applied to a broad field of knowledge by naturalists and workers with drugs and drug plants.

It was adopted in 1825 by Th. W. C. Martius in his lectures at the University of Erlangen and used by this pioneer teacher of the subject in his book called "*Grundriss der Pharmakognosie des Pflanzenreiches*" which was published in 1832. In this treatise he defines the term as follows: "Pharmacognosy is part of the universal knowledge of commercial materials." "We recognize, thereby, the science of medicinal materials obtained from the three natural kingdoms in regard to inquiry about their source, tests for their purity, as well as investigation into their substitu-

tion and adulteration." "The word is formed from φαρμακον (poison, medicine) and γιγνῶσκω (I recognize), therefore also known as the knowledge of recognizing poisons and medicines, commercial materials, crude drugs and raw materials.

Schleiden, author of the cellular theory for plants and the first histological pharmacognosist, called pharmacognosy the mother of all natural science disciplines.

Flückiger, co-author with Hanbury of the "*Pharmakographia*," states that it is the simultaneous application of various scientific disciplines with the object of acquiring the knowledge of drugs from every point of view. This definition is as broad as the literal interpretation of pharmacology.

Many of the authors of medical and pharmacy texts call it the science of crude drugs.

Let us see how pharmacognosists of the present day define this term.

Tschirch states "Under the name Pharmacognosy we recognize the knowledge whose problem it is to know the plant and animal drugs from all points of view and, with the exception of physiological action, to correctly describe them and classify them from all general points of view."

In his great work, "*Handbuch der Pharmakognosie*," now in its second edition, he points out eleven departments of this science, as follows: 1. Pharmaco-culture, 2. Pharmaco-handling, 3. Pharmaco-sorting, 4. Pharmaco-botany, 5. Pharmaco-zoölogy, 6. Pharmaco-chemistry (including variation statistics), 7. Pharmaco-physics, 8. pharmaco-geography, 9. pharmaco-history, 10. pharmaco-ethnology, 11. pharmaco-etymology.

Greenish, the renowned pharmacognosist, uses the terms Materia Medica and Pharmacognosy synonymously and defines either as that science which aims at a complete and systematic knowledge of crude drugs of animal and vegetable origin.

Rusby, in his "*Manual of Structural Botany*," states that pharmacognosy is the identification, valuation and selection of drugs.

Youngken, in "*A Text Book of Pharmacognosy*," 3d ed., defines pharmacognosy as the science which treats of the history, commerce, collection, selection, identification, valuation and preservation of crude drugs and other raw materials of vegetable and animal origin.

Newcomb, Darbaker, Gathercoal and Fischer, in "*Kraemer's Scientific and Applied Pharmacognosy*," 3d ed., define it as the study of organic drugs and allied products.

Suppan, in "*Wall's Handbook of Pharmacognosy*," defines it as that branch of knowledge which is concerned with crude drugs derived from the vegetable and animal kingdoms as they occur in trade.

Culbreth lists it as a subdivision of pharmacology along with pharmacy, pharmacodynamics, toxicology and therapeutics, stating that it comprises the physical and chemical characters of drugs—the knowledge of selecting, recognizing and identifying true and false specimens by such characteristics.

What is pharmacognosy? Are we to define it so as to make it cover the ground to suit our fancies or those of our predecessors or, are we ready to frame a definition based upon the ground covered by its practice to-day? If the latter, which to me seems the only logical method, let us consider its objects which are in the main the determination of identity, quality and purity. To accomplish these

the following kinds of work here summarized are actually carried out by pharmacognosists at the present time:

1. The collection of crude drugs and other raw materials from both living kingdoms.
2. The cultivation of drug, spice and oil plants.
3. The identification of crude drugs, spices, commercial gums, resins, paper and textile fibers, woods and other raw materials from plants and animals together with their adulterants and substitutes.
4. The garbling, grading, shipping and curing of crude drugs, condiments and other raw materials.
5. The valuation of crude drugs, spices, and other products obtained from plants and animals, involving organoleptic, physical, chemical, microchemical, microsublimation and pharmacodynamic tests, as well as histological examination.
6. The preservation of these raw materials of vegetable and animal origin from the ravages of insects, mites, molds, bacteria, yeasts and other organisms, as well as the influence of temperature, moisture and light.
7. Inquiry into the history, geographical distribution, trade routes and commercial sources of these natural products of plants and animals.

A definition embracing all of these practices involved in the modern practice of pharmacognosy might read as follows:

Pharmacognosy is the science which treats of the history, distribution, commerce, collection, cultivation, identification, selection, valuation and preservation of crude drugs and other organic materials of vegetable and animal origin, indeed a wide field and basic to the practice of pharmacy.

Accordingly, pharmacognosy would not be synonymous with materia medica, for the latter, being the study of all medicinal materials, not only includes the crude drug phases of pharmacognosy, but in addition the mineral drugs, the refined products of crude drugs, the medicinal synthetics and preparations of all of these. Nor would it be synonymous with pharmacology in either the broad or restricted use of the latter term, for in its broadest use pharmacology embraces every kind of inquiry into drugs and other remedial agents, while in its more restricted use it deals with the action of drugs upon living organisms.

MATERIA MEDICA—HOW DEFINED?

BY B. V. CHRISTENSEN.*

It appears that during the past half century there has been considerable confusion regarding the meaning and proper use of the term "Materia Medica." It has been confused with Pharmacognosy, Pharmacology and even Chemistry and has been frequently used synonymously with those terms and especially the first two.

According to Murray, "A New English Dictionary," this term was used by Galen (131–200 A.D.) in a generic sense, to mean "medical material," *i. e.*, the remedial substances used in the practice of medicine. As a science it was considered that branch of medical science which treats of these substances. At that time

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remedial substances were largely derived from plants and it may be that this is the basis for the later use of this term as a synonym for Pharmacognosy.

With the organization of medical schools it appears that this term was adopted to designate that branch of medical science which dealt with the nature and properties of all the substances employed for the cure of disease. When Pharmacy became a separate branch of medicine and schools of pharmacy were organized, this term was apparently adopted and used in a similar sense.

In the early days of medical schools and of schools of pharmacy there were fewer subjects in the curricula and there was not the high degree of specialization that exists under modern conditions. With the development of specialization many of the broad and widely inclusive terms used to designate subjects of the curricula were subdivided and replaced by terms indicating branches of science narrower in scope and more definite in nature and content of subject matter. Hence, we now have such terms as pharmacology, therapeutics, toxicology, posology, pharmacodynamics and pharmacognosy, which appear to be subdivisions of the old "Materia Medica." However, that there is a considerable difference of opinion and consequent confusion as to which of these is the broader and parent term is evident from the following definitions taken from textbooks, dictionaries and encyclopedias.

Wood, Geo. B.—"Therapeutics and Pharmacology," vol. I (1856).

Pharmacology, or the science of *Materia Medica*, treats of medicines in all their relations; *Therapeutics*, of remedies in general, and their application to the cure or alleviation of disease.

Wood, H. C., Jr.—"A Treatise on Therapeutics Comprising Materia Medica and Toxicology," 3rd ed., 1880.

"Pharmacology" is the general term employed to embrace these three divisions—

Pharmacy—science of preparing medicines.

Therapeutics—application of medicines to the cure of disease.

Materia Medica—(basis for both of these studies) a knowledge of the substances used as medicines.

Maisch—"Manual of Organic Materia Medica," 7th ed., 1899.

The primary object of *Pharmacognosy* or *Materia Medica* is to enable us to recognize drugs, to determine their quality, to detect their adulteration and to distinguish the characteristic elements of those which are closely allied.

Bastedo, W. A.—"Materia Medica, Pharmacology and Therapeutics," 2nd ed., 1922.

Materia Medica—drug remedies are known collectively as the "materia medica," or medical materials. The science which deals with the properties of drugs is called materia medica or, more correctly, pharmacology. It is a term that is employed in a broad sense to include everything relating to drugs.

The fields are:

1. *Pharmacognosy*—the study of the physical properties of crude drugs.
2. *Pharmacy*—the art of preparing drugs for use.
3. *Pharmaceutic chemistry.*
4. *Pharmacodynamics or Pharmacology* (in its restricted sense).

Cushny's—"Pharmacology and Therapeutics," 9th ed., 1928.

Materia Medica—comprised an examination of the botanical and chemical properties of drugs along with some account of the diseases in which they had proved of value.

A term used up to the middle of the nineteenth century.

This descriptive rather than experimental study has been continued under the name of *Pharmacognosy* but is now pursued by pharmacists chiefly.

Culbreth—"Materia Medica and Pharmacology," 7th ed., 1927.

"*Materia Medica* (Medical Material)—is a treatise upon the materials, agents, or appliances used in medicine—including their name, source (origin) habitat, family, (natural order—organic) physical characteristics, methods by which obtained, tests for purity and adulterations, constituents (composition), forms of administration (preparations), physiological action (properties), uses (therapeutics—therapy), normal and lethal doses, antagonists, incompatibilities, synergists (organic and inorganic), and other important features."

Subdivided:

1. *Pharmacy*—comprising the art of preparing drugs in suitable forms for dispensing, administering or applying.....
2. *Pharmacognosy*—comprising the study of physical and chemical characters of drugs—the knowledge of selecting, recognizing and identifying true and false specimens by such characteristics.
3. *Pharmacodynamics*—comprising the knowledge of physiological action.
4. *Toxicology*—comprising the effect, nature and detection of drugs when given in poisonous doses—the treatment and antidote for same.
5. *Therapeutics*—comprising the intelligent application or use of agents to cure disease—how they act on living organisms during sickness.

Pharmacology is a similar but more modern term.

McGuigan—"A Textbook of Pharmacology and Therapeutics," 1928.

Pharmacology is the term used to include all knowledge of drugs and their actions. For convenience of study, pharmacology may be divided into the following branches:

1. *Pharmacodynamics* is the study of action of drugs on living organisms.
2. *Materia Medica* treats of the source, constituents, physical and chemical characteristics, preparations and doses of drugs.
3. *Pharmacognosy* may be considered as a part of materia medica, and deals especially with the recognition of drugs and the study of crude materials. The term pharmacognosy is sometimes used synonymously with materia medica.
4. *Pharmacy* is the science and art of preparing and dispensing drugs for medicinal use.
5. *Therapeutics* is the art and practice of treating abnormal states.
6. *Posology* is the science of dosage.
7. *Toxicology* deals with the symptoms, diagnosis, treatment and detection of poisons.

Sollmann—"A Manual of Pharmacology," 3rd ed, 1927.

Pharmacognosy deals with the origin and the anatomic and chemic structure of crude drugs.

Materia Medica is an older *obsolescent* title, which was used to include also the actions, uses and dosage.

Organic materia medica is limited to the drugs derived directly from the vegetable and animal kingdoms.

"Webster's New International Dictionary," 1929.

Materia Medica:

1. Materials or substances used in the composition of remedies; a general term for all substances used as curative agents in medicine.

2. That branch of medical science which treats of the nature and properties of all the substances employed for the cure of disease; one of the two branches of pharmacology.

Pharmacology—the science of drugs including materia medica and therapeutics.

Pharmacognosy—Pharmacology, or especially that branch of it treating of the characteristics of crude drugs and simples.

"Funk & Wagnall's New Standard Dictionary," 1926.

1. The branch of medical science that relates to medicinal substances, their nature, sources, mode of administration and effects upon the animal economy.

2. The substances employed as remedial agents.

"The Encyclopedia Americana" (1929), vol. 18, p. 425.

Materia Medica, that division or branch of medical science which treats of drugs, their origin, classification as natural products, preparation, purification, action on the animal economy, together with the mode of administering them for the relief and cure of disease.

Of the several definitions quoted that of Culbreth appears to be the most reasonable and logical in view of the history of the term *materia medica*. It appears also that Sollmann is correct in saying that, as applied to a science, it is an "obsolescent title." From the various definitions quoted it is also evident that the term "Materia Medica" is too broad to be applied to any one subject or even to more than one with any assurance of conveying a reasonably definite concept. The prefixing of such terms as "organic" or "inorganic" is of little if any value in limiting this as a title for a science. The term "Materia Medica" as a title for a science or as a title for a subject in a curriculum should be dropped and more suitable and definite terms used—terms which are limiting as to scope of subject matter and character of information.

As a generic term, with its literal meaning "materials of medicine," it probably has a place in our professional vocabulary. When used in this sense it would simply mean a list of all materials used in medicine and could be properly used as follows: "American materia medica is made up of several hundred items" or "Eupatorium has no place in modern materia medica."

In conclusion, it appears that as a title for a science the term "materia medica" should be dropped for the reason that materials of medicine may be studied from so many different angles that this term does not convey any meaning either as to scope or character of information.

COMMITTEE REPORTS

REPORT OF THE VITAMIN ASSAY COMMITTEE OF THE AMERICAN DRUG MANUFACTURERS' ASSOCIATION—TWENTY-FIRST ANNUAL MEETING—APRIL 1932.

BY ARTHUR D. HOLMES, CHAIRMAN.

Immediately following the 1931 annual meeting of the American Drug Manufacturers' Association the Vitamin Assay Committee attended a special meeting called by the United States Pharmacopœia Revision Committee. This meeting was arranged by the Chairman of the Revision Committee to develop methods for the assay of vitamin A and vitamin D. The meeting was attended by twenty-five of the leading vitamin investigators in this country. Early in the meeting it was decided to prepare tentative vitamin A and vitamin D methods to be presented at the special League of Nations meeting which was to be held in London, June 17th. The vitamin A and vitamin D methods outlined in detail in your Committee's May 1931 report served as the basis of consideration. During the meeting the methods suggested by your Committee were discussed in detail from the viewpoint of investigators in academic, industrial, consulting and medical laboratories. After full discussion the United States Pharmacopœia Vitamin Advisory Committee concluded that your Committee's vitamin A method, modified in certain respects, and the vitamin D method, practically unchanged, should be presented by the American representatives, Prof. E. V. McCollum and Prof. Harry Steenbock, at the London meeting of the League of Nations.

During the consideration of vitamin methods and standardizations by the League of Nations Permanent Commission on Biological Standardization it was agreed that International vitamin units should be defined and adopted. Since it is at present believed that Carotene is the parent substance of Vitamin A and since it is possible to prepare this material in pure form it seemed logical to use Carotene as the basis for defining an International vitamin A unit. Consequently it was recommended at the League of Nations meeting that the Vitamin A activity of one gamma (0.001 mg.) of the International standard Carotene be considered as one vitamin A unit.

The Permanent Commission on Biological Standardization defined a vitamin D unit as follows:

"The unit of vitamin D recommended for adoption is defined as the vitamin D activity of 1 milligram of the international standard solution of irradiated ergosterol."

The further consideration of vitamin methods and vitamin standards by the Permanent Commission on Biological Standardization may be summarized by the following excerpts from its report.

"It was decided not to recommend any one particular method of conducting the biological assay, but to invite members of the Conference to submit to the League of Nations Health Organization their observations on the value of the methods they have been using."

..."The Conference recommends that Carotene be accepted as an international provisional standard of reference for vitamin A and that a selected sample of cod liver oil be held in view as a possible secondary standard."

..."The Conference recommends that the standard solution of irradiated ergosterol at present issued from the National Institute of Medical Research, London, be adopted as international vitamin D standard for the next two years."

Subsequent to the London meeting of the League of Nations the Chairman of the U. S. P. Revision Committee sent a report of the conclusions adopted at the London meeting to the members of the U. S. P. Vitamin Advisory Committee. He then issued invitations for a second Conference on vitamin methods for January 8, 1932. This Conference was held in New York and was attended by thirty-three persons interested in vitamin assay methods. On January 7th your Committee met and gave careful consideration to the various details of vitamin A and vitamin D assay methods. In the light of additional data which had been assembled and recent developments in the knowledge of the nature of vitamin A and D your Committee prepared and recommended the following vitamin A and vitamin D methods for consideration by the special U. S. P. vitamin conference held on January 8th.

ASSAY METHODS RECOMMENDED BY THE AMERICAN DRUG MANUFACTURERS' ASSOCIATION VITAMIN COMMITTEE FOR CONSIDERATION BY THE UNITED STATES PHARMACOPŒIA VITAMIN ADVISORY COMMITTEE, JANUARY 8, 1932.

VITAMIN A AND D ASSAY FOR COD LIVER OIL AND RELATED PRODUCTS.

I. Vitamin A.—Cod liver oil shall be assayed for its vitamin A by the following process or method: It is recommended that a cod liver oil of known potency assayed by the assay method herein described be accepted as a provincial Standard of Reference for vitamin A, and that a selected sample of carotene be held in view as a possible secondary standard. When so assayed, the oil shall contain at least 400 vitamin A units per Gm. or the equivalent in international units.

This assay is based upon the estimation of the minimum amount of cod liver oil necessary to meet specific growth-promoting as well as relative anti-ophthalmic requirements in a standard test animal kept under definite control. The test animals shall be rats from known source and bred preferably under the direction of the experimenter.

The vitamin A potency of the cod liver oil shall be expressed in units per Gm. of oil, the unit to be the minimum daily amount (in mg.) of cod liver oil required to cause, in sixty per cent of the animals in any one group, a gain in weight of at least twelve Gm. within a period of 28 days under the conditions of growth and diet specified in this assay. The maximum weight must be attained at the end of the test, and the eye condition must be corrected by an amount of cod liver oil not to exceed three times the minimum growth factor.

The vitamin A content per Gm. of cod liver oil is computed by dividing one thousand mg. (1 Gm.) by the determined minimum daily amount of oil, in mg., required to induce the requisite growth recovery.

Method for Vitamin A.—It is desirable that each laboratory should establish its own breeding colony or else secure rats under known conditions as to age and dietary history.

In the breeding program, the males and females should be kept on a well-balanced diet which is not too excessive in the vitamins A and D. The following diet has been tried by several laboratories and is suggested:

BREEDERS' DIET.

	Per Cent.
Wheat meal (entire kernel)	33.0
Yellow corn meal (entire kernel)	34.0
Whole milk powder	21.0
Old process linseed oil meal	7.0
Alfalfa leaf flour (green color)	2.0
Liver (vacuum dried)	2.0
Calcium carbonate	0.5
Sodium chloride	0.5

Such diet should be supplemented daily by giving each rat some fresh green leafy vegetable, preferably lettuce or spinach, about five Gm. per animal.

When the females are about one hundred days old, they are mated. The litters are reduced to seven rats each when the young are five to seven days old. On the tenth to twelfth day, the green stuff is discontinued. At weaning (21–23 days old) the mother is taken away and placed on the regular diet.

When the young are 21–26 days of age, weighing 38–45 Gm. they are fed the Vitamin A Free Diet, but adequate in other respects, so as to deplete them for the vitamin A test.

VITAMIN A FREE DIET.

	Per Cent.
Casein (freed from vitamin A)	18
Salt mixture (Osborne & Mendel,[1] or McCollum,[2] No. 185)	4
Agar (finely ground)	2
Yeast (dried) (1)	8

[1] *Jour. Biol. Chem.*, 37 (1919), 572.

[2] *Ibid.*, 47 (1921), 121.

	Per Cent.
Cornstarch	63
Hydrogenated vegetable oil (vitamin free)	5
Vitamin D (2)	
(The water supply should be distilled water)	

Animals fed such a diet should manifest, in due course, one or all of the following: decline in weight, or stationary weight, or xerophthalmia in varying degrees. Tentatively, it has been agreed to accept the weight criteria for the beginning of treatment with cod liver oil (or related products). Preferably, the ophthalmic condition should also be manifest, but in case it is not, then as a check, similar control test rats must show eye symptoms not later than 10 days after starting the treatment. The weight criteria are either a declining or stationary weight for 5 to 7 days. In order to insure more comparable conditions, the beginning of the administration of the cod liver oil should preferably not occur before the 25th day or after the 40th day of the vitamin A free preparatory period.

The distribution of rats, when ready, should be so adjusted that there will be at least six in each group, having one group as a negative control, and that the doses vary from group to group so that one can judge the potency of the oil above and below the unit value sought. To dilute the cod liver oil (or product) use vitamin A and D free peanut or corn oil. Check tests should be made on this diluent from time to time. The dilution should be made so that the dose at any time is not too large to affect the animal's condition. It is suggested that 0.1 cc. be used. The dilution should be made at least once a week, and kept in a cool, dark place. The Standard of Reference should be run parallel with the product under test. The doses should be given at regular intervals, separate from the diet, preferably daily.

A record should be made of the body weights and eye condition at least twice a week. The eye condition may be designated as normal, watery, sensitive to light, edema, bloody exudate, pustules and opacity of cornea.

II. Vitamin D (Antirachitic).—Cod liver oil (or related products) shall be assayed for its vitamin D content by the following method: It is recommended that a solution of irradiated ergosterol of definite potency, or a cod liver oil of known antirachitic potency, as assayed by this method be used as Standard of Reference. When so assayed, the oil shall contain at least 100 vitamin D units per Gm. or the equivalent in international units.

This assay is based upon the estimation of the minimum amount of cod liver oil necessary to initiate a specific degree of recalcification in the leg bones of rachitic rats reared and fed under definite control as specified hereinafter.

The vitamin D potency of cod liver oil shall be expressed in units per Gm. of oil, the unit to be the minimum average daily amount (in mg.) of cod liver oil required to produce, in 60% of the animals in any one group, a degree of recalcification represented by a narrow continuous "line" across the metaphysis of the leg bones of the rats which have been kept and fed under the conditions as specified in the assay.

The vitamin D content per Gm. of cod liver oil is computed by dividing 1000 mg. (1 Gm.) by the determined minimum average daily amount of oil in mg., required to induce the requisite degree of recovery. The average daily dose is understood to be the total amount of cod liver oil given divided by the length of the test period, 10 days.

Method for Vitamin D.—Use rats of a known dietary history as described under vitamin A method. When the rats are 25–30 days old, they should weigh 50–60 Gm. They are then fed either the Steenbock Ricket-Producing Diet, No. 2965, or the McCollum Diet, No. 3143.

After the experimental animals have been on the rachitogenic diet for a suitable period (18–21 days) examine the leg bones of 4 rats by the "line test" as described later, to ascertain whether a satisfactory stage of rickets has been attained.

NOTES: (1) The yeast should have a vitamin B complex potency such that not more than 150 mg. daily is required for the recovery test on the Sherman and Spohn basal vitamin B-complex ration.

(2) The vitamin D content of the diet, may be derived from any suitable source free from vitamin A, and should be equivalent to the vitamin D content of 3% of the Standard of Reference cod liver oil.

If so, the remainder are considered as satisfactory for the test, and should be distributed into groups of at least 7 animals each, reserving one group as a negative control. The doses should be varied from group to group so that one can judge the potency of the cod liver oil above or below the unit value sought. The Standard of Reference should be run parallel with the product under test.

STEENBOCK RICKET-PRODUCING DIET, NO. 2965.[1]

	Per Cent.
Whole yellow corn (freshly ground)	76
Wheat gluten	20
Calcium carbonate	3
Sodium chloride	1

MCCOLLUM RICKET-PRODUCING DIET, NO. 3143.[2]

Corn (yellow)	33
Wheat (soft winter)	33
Wheat gluten	15
Gelatin	15
Calcium carbonate	3
Sodium chloride	1

The rats should receive distilled water.

From the beginning of the administration of the cod liver oil, and the Standard of Reference, the rats should be kept in individual cages and a record should be made of the daily food consumption.

The cod liver oil (or related product) and the Standard of Reference should be diluted with a vitamin A and vitamin D free oil, such as peanut or corn oil, so that the total daily volume of oil consumed by each rat shall not exceed 0.1 cc. These dilutions should be prepared as often as once a week. The dilutions should be fed separate from the diet. The negative control group should receive an equivalent amount of the diluent.

The dilutions should be given over a period of 8 consecutive days. The rats are then continued on the rachitogenic diet for the balance of the ten-day test period to allow for the latent effect.

Any animal which has lost weight continuously during the test period, has eaten less than two Gm. of food on two consecutive days, or has averaged to eat less than four Gm. of food per day should be excluded from the final interpretation.

At the end of the 10th day of the test, the animals should be killed, and the femur and tibia (or ulna and radius) removed from the right leg and preserved in formalin (10%) for examination essentially as follows: rinse in water, split, place in acetone for 3 minutes, dry, treat with silver nitrate (2%) for 3 minutes, place under a bright light until the "line" is clearly evident, immerse in sodium thiosulfate solution (5%) for 3 minutes, and examine under binocular microscope.

Early in the January 8th Conference the U. S. P. Vitamin Advisory Committee agreed to adopt the international vitamin A and vitamin D units recommended at the London Conference. The Vitamin Advisory Committee also agreed to adopt cod liver oil as a Reference Standard for vitamin A assays and a solution of irradiated ergosterol or cod liver oil as a Reference Standard for vitamin D assays—the Reference Standards to be prepared, evaluated and distributed by the Food and Drug Administration, Department of Agriculture, Washington, D. C.

Following these decisions a number of those present contended that since vitamin units and vitamin standards had been adopted there was no occasion for preparing or adopting vitamin methods. When it had been definitely established that it was essential for the Pharmacopœia to contain assay methods the vitamin methods recommended by your Committee were utilized as a basis for consideration in the preparation of official U. S. P. methods. Early in the discussion of vitamin methods it was decided not to include in the Pharmacopœia methods any details concerning the nature or management of the breeding colony from which the experimental animals would

[1] *Jour. Biol. Chem.*, 64 (1925), 263.

[2] *Ibid.*, 47 (1921), 507.

be obtained. Much discussion developed concerning the essential details of official vitamin methods. Eventually, however, vitamin A and vitamin D methods were prepared for recommendation to the U. S. P. Revision Committee. These methods which have not yet become official are very similar in form and substance to the vitamin A and vitamin D methods reported above.

During the year which has elapsed since your Committee's last report the Executive Committee of the American Drug Manufacturers' Association has voted that the activities of your Committee which have been confined to a consideration of vitamin A and D methods are extended to include a study of methods of assay of other vitamins. Obviously this action is to the interest of the American Drug Manufacturers' Association since a number of its members are manufacturing and distributing products containing vitamins other than vitamin A and vitamin D. It is needless to say that it is desirable in such instances that the member be in a position to make claims for the vitamin activity of his product and that he be in a position to substantiate his claims by submitting the results of a vitamin assay of his product made by approved or official methods.

It is the feeling of your Committee that very definite progress has been made during the current year. The Committee feels that it has contributed in no small way to the development of forthcoming U. S. P. Assay methods for vitamins A and D, and it desires at this time to express its appreciation of the support and encouragement which the American Drug Manufacturers' Association has constantly extended to it.

NEW JERSEY ANNOUNCEMENT REGARDING THE FOUR-YEAR COURSE IN PHARMACY.

Secretary Robert P. Fischelis announces that the Board of Pharmacy of the State of New Jersey desires to call attention to the following resolution bearing on the type of four-year course which will be approved by this Board as meeting the college graduation requirement. This resolution was passed at a meeting of the Board held in Trenton, March 1, 1932.

WHEREAS the Board of Pharmacy of the State of New Jersey on September 25, 1928, adopted a resolution making it mandatory for all applicants for registration as pharmacists in New Jersey who begin their college course in pharmacy any time after January 1, 1932, to submit proof of graduation from a four-year course in a College of Pharmacy approved by this Board; and

WHEREAS the Board of Pharmacy of the State of New Jersey on January 27, 1930, adopted a resolution declaring it to be the sense of this Board that approval of the four-year course in Pharmacy shall be confined to such courses and institutions as will recognize the need for fundamental training in Physics, Chemistry and Biology as a basis for the course in Pharmacy, as well as the need for the addition of so-called cultural subjects to the curriculum, such as English, some phases of History, Economics and one or more Modern Languages, and

WHEREAS the time has arrived for a more specific statement as to the character of the four-year course in Pharmacy to be approved by the Board of Pharmacy of the State of New Jersey, be it

Resolved, that the following rules and regulations, in addition to the general rules for approval of courses in Pharmacy promulgated by this Board, July 1, 1926, shall govern the approval of four-year courses in Pharmacy to be accepted by this Board as meeting the college requirement under the New Jersey Pharmacy Act:

1. Courses totalling less than 800 clock hours of instruction per college year for each of the four years of the course and which do not include at least 40% of laboratory work (in clock hours) will not be approved.

2. Courses offered on a three- or four-day per week schedule will not be approved.

3. Courses leading to any other degree than a fully recognized Bachelor of Science degree of University grade will not be approved.

4. Courses in which a degree such as Ph.G. or Ph.C. is awarded at the completion of the third year of the course to be followed by an additional year leading to a Bachelor's degree will not be approved.

5. The type of four-year course which is most apt to receive approval of this Board will be a well-rounded course in which Pharmacy will play the predominating rôle. Courses which are worked out on the basis of a Freshman year of general college work and which actually amount to a three-year course in pharmacy based upon four years of high school work and one year of a liberal arts or science college course will be approved for the time being; but courses in which the

first three years are devoted to instruction similar to the present three-year pharmacy course and the fourth year is devoted to so-called cultural subjects exclusively, will not be approved.

6. Courses in which the fundamental science and so-called cultural subjects are not of a quality to receive full University credit in the institution of which the College of Pharmacy is a part, or in other recognized Colleges and Universities, will not be approved.

7. In general it is the view of the Board of Pharmacy of the State of New Jersey that the four-year course in pharmacy was adopted as the minimum of collegiate training necessary to meet the educational requirements for the proper practice of pharmacy and that neither the letter nor the spirit of this requirement should be evaded by make-shift courses or combinations of courses. It is the further view of this Board that the intent in demanding a four-year course of instruction was to place the training of pharmacists on a par with the training received by other candidates for baccalureate degrees and that the same care should be exercised in providing properly graded instruction and as much individual attention to the student as is to-day provided in the better type of liberal arts and science courses.

These views will control in deciding upon the courses to be approved by this Board as meeting the College requirement under the New Jersey Pharmacy Law.

BRITISH POST-GRADUATE DIPLOMAS.

For some time past the Council of the Pharmaceutical Society has been considering the consolidation of the examination regulations, and arising out of their deliberations two subcommittees were set up to consider the question of the institution of diplomas in the analysis of foods and drugs and in biological analysis, respectively. These two committees have now reported and their recommendations have been approved by the Council. The necessary regulations are now being drafted. Originally it was decided that these diplomas should be post-graduate to the "Pharmaceutical Chemist" qualification, but after discussion it was suggested that one or both might be post-graduate to the "Chemist and Druggist" qualification, and this point is to be given further consideration. The outline for diploma in pharmaceutical analysis is as follows: The diploma must represent an unquestionably high standard of proficiency. Candidates should have had some practical experience in the work, and as a general rule should be required to have attended an approved course of instruction for the diploma. This latter requirement might be waived in the case of candidates who were able to satisfy a committee appointed for the purpose that they had long practical experience of pharmaceutical analytical work. An approved course of instruction might be either a day or an evening course. The full-time day course should not extend over less than an academic year, and the Council might invite opinions from the institutions recognized for the "Chemist and Druggist" and the "Pharmaceutical Chemist" examinations as to the precise length of the course. The examination should be mainly a practical one, and should last at least five days. Candidates should be free to consult textbooks, and should be required to bring their practical notebooks. One examination a year should be sufficient at first. The Committee suggests as a title, "The Diploma in Pharmaceutical Analysis," with a possible abbreviation "D. P. A. (Pharm. Soc.)."

The proposals for the diploma in biochemical analysis are based on the assumption that there would be a sufficient demand for the services of pharmacists possessing such a qualification. The demand, it is thought, would come principally from hospitals, but there would also be opportunities elsewhere. The course for the diploma should be based upon some knowledge of physiology, and consist chiefly of the practical physiological chemistry of the body fluids. Bacteriology (apart possibly from its application to sterilization) should be excluded from the course. The most suitable title for the diploma would be, "Diploma in Biochemical Analysis." The course of training for the diploma should consist of approximately thirty to fifty lectures of one hour's duration and a similar number of two-hour periods' practical work, a minimum of ninety hours in all.

The Indian and Eastern Druggist.

The late Dr. W. W. Keene was a veteran of the medical profession, and a surgeon who received many honors at home and abroad. He devoted his opportunities and abilities to the service of humanity and was modest in all of his achievements.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1931–1932.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 12.

May 20, 1932.

To the Members of the Council:

87. General Program for the Eightieth Annual Meeting. Motion No. 30 (see Council Letter No. 10, page 513) has been carried and the program is approved.

88. Election to Membership. Motion No. 31 (see Council Letter No. 10, page 514) has been carried and applications numbered 276 to 282, inclusive, are declared elected.

89. American Council on Pharmaceutical Education. One of the expected results of the proposed Study of Pharmacy was the formation of some organization to put the information developed by the study and such recommendations, as might be made with respect to education and registration, into effect. Under the conditions which have existed since the Study of Pharmacy was proposed, it has not been possible to secure appropriations from any source to match those made by the N. A. B. P., the A. A. C. P. and the A. PH. A., although the Committee on the Study of Pharmacy representing the above-mentioned associations and the Pharmaceutical Syllabus Committee has made every effort to do so, with the coöperation and advice of the American Council on Education.

Several suggestions have been made that, pending the study a Council on Pharmaceutical Education, composed of representatives of the N. A. B. P., the A. A. C. P. and the A. PH. A., be formed to set up standards for schools of pharmacy and to approve such schools as meet and maintain these standards. As the result the Committee on the Study of Pharmacy, at its meeting in Miami in July 1931, appointed a sub-committee to consider a plan for the organization of such a Council, the plan to be submitted to the three associations for approval. Attention is called to Resolution No. 5 adopted at the Miami meeting.

The following letter has been received from Chairman L. L. Walton of the Committee on the Study of Pharmacy:

"I have the honor of submitting to you herewith a copy of the report of the Sub-committee to consider the organization of a Council on Pharmaceutical Education, and I request that you please present the matter before the Council of the A. PH. A. at the proper time and for such action as it may care to take looking toward the approval of the report and subsequent approval by the three organizations interested.

"The Committee on the Study of Pharmacy will probably hold its next meeting at Toronto, early in the week of the meeting of the A. PH. A. It is desirable, therefore, that the Chairman be advised of the action of the Council in respect to this matter before the meeting is called. I want to be able to present the views of the three associations respecting the report at the first meeting of this committee in Toronto."

The report of the sub-committee is quoted and, following it, the proposed Constitution and By-Laws of the Council on Education:

"To the Committee on the Study of Pharmacy:

"Your Sub-committee appointed to consider a plan for the organization of a Council on Pharmaceutical Education, the plan to be submitted to the three associations for approval, begs to submit the following report:

"Careful consideration was given to the report of the Committee on Pharmaceutical Education appointed by the American Association of Colleges of Pharmacy, of which A. G. DuMez was Chairman. Your committee communicated with the American Medical Association asking for advice regarding the working of their Council on Medical Education and also with the American Dental Association. A proposed Constitution and By-Laws was then prepared, a copy of which is attached to this report. This Constitution and By-Laws has the approval of all members of the Sub-Committee.

"No attempt was made to prepare a budget, but it has been suggested that the budget for the first year be small and in-

creased as results warrant. It has been suggested that $1500.00 be sufficient for the first year."

(Signed) C. B. JORDAN, *Chairman*
A. C. TAYLOR
E. F. KELLY.

PROPOSED CONSTITUTION AND BY-LAWS OF AMERICAN COUNCIL ON PHARMACEUTICAL EDUCATION.

ARTICLE I. *Name.* The name of this organization shall be "American Council on Pharmaceutical Education."

ARTICLE II. *Objects.* The objects of this organization shall be:

First. To formulate the educational, scientific and professional principles and standards which an approved school or college of pharmacy will be expected to meet and maintain.

Second. To revise these principles and essentials when deemed necessary or advisable.

Third. To investigate any school or college of pharmacy that requests the approval of this organization.

Fourth. To publish a list of approved schools or colleges of pharmacy and to revise such lists annually or as frequently as deemed desirable.

Fifth. To satisfy itself that the schools and colleges which have been approved maintain the proper standards through occasional conferences with members of the faculties and an inspection of each school or college every five years, or at such time during the interim as may seem desirable. The approval of any school or college failing to maintain the standards formulated by the Council shall be withdrawn.

Sixth. To assist in the advancement and improvement of pharmaceutical education and registration.

ARTICLE III. *Membership.* The Council shall be composed of nine voting members and one advisory member to be selected as follows: The AMERICAN PHARMACEUTICAL ASSOCIATION, the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy shall each elect or appoint three voting members; the American Council on Education shall appoint the advisory member.

ARTICLE IV. *Term of Office.* In the initial organization of the Council the AMERICAN PHARMACEUTICAL ASSOCIATION, the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy shall each elect or appoint one voting member for a term of two years, one for a term of four years and one for a term of six years. Thereafter all voting members shall be elected or appointed by these organizations for a term of six years. The appointment of the advisory member shall be for a term of six years. Each organization shall fill vacancies in its membership by election or appointment either for the full term or unexpired portion thereof.

ARTICLE V. *Quorum.* Seven voting members shall constitute a quorum for doing business. If less than seven voting members be present at any meeting, the business of that meeting may be regularized by securing approval in writing of a sufficient number of absent members to equal seven.

ARTICLE VI. *Officers.* The officers of the Council shall consist of a Chairman and Secretary-Treasurer to be elected by the Council, and they shall hold office for a term of one year.

ARTICLE VII. *Conduct of Business and Duties of Officers.* The Council shall adopt such measures as are necessary for the orderly conduct of its business and shall instruct its officers and committees regarding their duties.

ARTICLE VIII. *Salaries.* All members, voting and advisory, shall serve without pay, but any expense incurred by members in the official conduct of the business of the Council shall be paid by the Council. The officers of the Council may employ stenographic and other help to be paid for by the Council if approval of such employment has been previously secured from the Council.

ARTICLE IX. *Meetings.* The Council shall hold at least one meeting a year at a time and place designated by the Council. Special meetings may be held by direction of the Council, or, in case of emergency, may be called by the officers. (The organization meeting shall be held as soon as this constitution and by-laws are approved by the three organizations and members of the Council are appointed.)

ARTICLE X. *Amendments.* Any proposal to alter or amend this Constitution shall be submitted to the Council by a member thereof. If such proposed alteration or amendment is approved by the Council, the proposal shall be submitted to the AMERICAN PHARMACEUTICAL ASSOCIATION, National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy and, if approved by all of these organizations, it shall become a part of this Constitution.

BY-LAWS.

No. 1. Robert's Rules of Order shall govern in the transaction of business of the Council.

No. 2. No organization appointing or electing members to this Council shall secure an unequal influence in the deliberation thereof because of any contributions it may make to the budget of the Council.

No. 3. *Committees.* The Council shall establish such committees as it deems necessary.

No. 4. *Funds.* The Council shall prepare a budget annually, said budget to cover only legitimate expenses for the effective performance of the work of the Council. This budget may be altered as the Council sees fit, provided no debts are incurred before funds are forthcoming to pay them.

The funds for the budget shall be secured by annual contributions from the AMERICAN PHARMACEUTICAL ASSOCIATION, the National Association of Boards of Pharmacy, the American Association of Colleges of Pharmacy, and from other sources that may be available.

No. 5. *Disbursement of Funds.* All disbursements of moneys shall be upon the written order of the Chairman of the Council, and the Secretary-Treasurer shall annually submit an itemized account of all receipts and disbursements to the Council for approval, and shall send a report of same to each constituent organization.

No. 6. The Secretary-Treasurer shall submit an annual report of the activities of the Council and, after approval, said report shall be submitted by him to the constituent members.

No. 7. These By-Laws may be altered or amended at a regular meeting of the Council by a two-thirds vote of the voting membership.

The report and the proposed Constitution and By-Laws were submitted to Messrs. H. A. B. Dunning and W. W. Horne, the other A. PH. A. representatives on the Committee on the Study of Pharmacy, and were approved by them.

(Motion No. 33) It is moved by Kelly that the organization of the American Council on Education and the proposed Constitution and By-Laws of the Council be endorsed and submitted to the American Pharmaceutical Association during the Toronto meeting with a favorable recommendation for approval. The contribution of the A. Ph. A. to the expenses of the Council will be determined after the Council is organized and has worked out a budget.

90. Use of Text of N. F. V. A request has been received from the National Association of Retail Druggists to use the text of the National Formulary for partial reproduction in a booklet for distribution to the members of the dental profession. The booklet will be similar in size and general appearance to the publication previously issued by the N. A. R. D., entitled "Some Important U. S. P. and N. F. Preparations." The request was submitted to the Committee on Publications and the following communication has been received from Chairman DuMez:

> "In reference to the publication by the N. A. R. D. of a booklet to be distributed to members of the dental profession, it is recommended that permission for the use of the text of the National Formulary be granted on the same terms as made heretofore."

(Motion No. 34) It is moved by DuMez that the N. A. R. D. be given permission to use the text of the N. F. V for partial reproduction in the preparation of a publication to be distributed to the members of the dental profession and at the usual charge of $5.00.

91. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 283, Gabriel Brown, Cleveland State Hospital, Cleveland, Ohio; No. 284, J. H. Bugg, U. S. Marine Hospital, Galveston, Texas; No. 285, O. P. Clark, 722 Walnut St., Chillicothe, Mo.; No. 286, Perry Clark, 601 Locust St., Chillicothe, Mo.; No. 287, B. Esecover, 459 Stone Ave., Brooklyn, N. Y.; No. 288, Geo. A. Evans, 68 Broadview Ave., Toronto 8, Ontario, Can.; No. 289, I. Leo Fishbein, 70 Carroll St., Paterson, N. J.; No. 290, Frances M. Hladky, Fleet Ave. and E. 50th St., Cleveland, Ohio; No. 291, W. L. Linton, 462 Wellington St., W., Toronto, Ont., Can.; No. 292, Clarence G. Miller, 660 State St., Madison, Wis.; No. 293, Eugene H. Smith, 2857 Ohio St., Omaha, Nebr.; No. 294, A. A. Stokes, 143 Fairview Ave., Toronto, Ont., Can.; No. 295, A. Lloyd Taylor, State Teachers College, Murfreesboro, Tenn.

(Motion No. 35) Vote on applications for membership in the American Pharmaceutical Association.

E. F. KELLY, *Secretary.*

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter.

CHICAGO.

The 205th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held on Tuesday evening, April 19, 1932, at the University of Illinois School of Pharmacy.

The meeting was called to order by President R. E. Terry.

A resolution was adopted to extend an invitation to the AMERICAN PHARMACEUTICAL ASSOCIATION and allied organizations to hold their annual meeting in Chicago during the World's Fair.

The speaker of the evening was Dr. Martin E. Hanke of the University of Chicago, Department of Physiological Chemistry and Pharmacology. His subject was "The Regulation of Neutrality in the Animal Organism." He opened his discussion by explaining that there had been considerable development in this field of investigation during the last ten years.

He stated that the hydrogen-ion concentration of human blood was normally 7.4 and that it shows variations of 0.2 of a p_H in either direction. In severe cases of acidosis the lowest p_H where an animal can live is 7.0 and the highest alkalinity ranges to about 7.8.

There is scarcely a detectable difference between arterial and venous blood. There is a constant loss of CO_2 in the lungs but there is a control mechanism to care for this loss.

Blood is neutral but has in it carbonic acid, sodium, acid phosphate and proteins, which ionize as acids. Present simultaneously are sodium carbonate, sodium phosphate and sodium salts of the proteins. These salts repress the ionization of the acids. All of these salts act as buffers. The acids react with the salts and the bases react with the acids. The result is a very slight change in the p_H of the blood.

Practically all enzymes have a p_H in which they act best, so the subject of hydrogen-ion concentration is very fundamental to living organisms.

There is a very delicate p_H in which the blood can carry carbon dioxide.

There are three points of view with regard to the neutrality regulation in the human systems. They are:

(1) The sources of acids and bases that enter as food.

(2) The excretory mechanism for getting rid of excess acid and base.

(3) The buffer mechanisms to control the p_H during the time the acids and bases are being taken in and eliminated.

The carbon dioxide comes from the breaking down of the food, and the respiratory mechanism is the main source of its exit.

Sulphuric and phosphoric acids come from the sulphur and phosphorus of the proteins and are excreted in the urine as salts.

The body receives a certain number of organic acids directly from food and they are oxidized to carbon dioxide. The fruits from which we obtain these acids also contain the sodium salts of these acids. With the oxidation of these substances to carbon dioxide the sodium is left to be excreted in the urine. Thus it can be seen that orange juice and the juice of other citrus fruits leave an alkaline ash to be

excreted. Milk also leaves an alkaline ash. The lactic acid produced during muscular activity goes into the blood and reduces its alkalinity.

The acidosis present in diabetes is due to the incomplete oxidation of the fats. Aceto-acetic acid is produced. This reduces the amount of alkaline base present.

Acid in the blood stimulates respiration so the carbon dioxide is swept out. Alkalinity depresses respiration and conversely the carbon dioxide is stored up to keep the p_H down.

Alkali reserve is defined in the terms of the carbon dioxide present in the blood. The sodium bicarbonate constitutes the major part of the alkali reserve.

Acidosis is not necessarily due to a low p_H but is associated with a low supply of sodium bicarbonate supply in the blood.

Normally the p_H of the urine is from 5.5 to 6.5. The involatile acids formed are excreted in the urine. The p_H of the urine varies in abnormal cases from 4.5 to 8.0. In acidosis the ammonia accumulates in the urine. Ammonia is a base. The nitrogen is normally excreted as urea, a neutral compound, but in acidosis the nitrogen comes out as the ammonium salts of the acids present. Thus, the formation of ammonia constitutes a mechanism for conserving the base.

Much precise information has been found in the last ten years in regard to the buffer mechanisms. They are the acids and the salts of the acids. We have in the blood, acid of the protein of the serum and sodium of the proteins. Hemoglobin exists as acid and the potassium salt of hemoglobin.

The buffers of the tissues are about five times the quantity of the buffers of the blood. Oxyhemoglobin is a strong acid as compared to reduced hemoglobin. Reduced hemoglobin in the tissues liberates alkali with a migration of acid and chlorine into the serum. This increases the carbon dioxide combining power of the blood.

Hemoglobin in its own right is a buffer in the blood. It has been recently found to have a new function in aiding in the diffusion of carbon dioxide into the lungs and out of the tissues.

Some of the pathological conditions associated with acidosis and alkalosis are: The coma of diabetes, which is due to extreme acidosis, hyperexcitability in alkalosis, uremia and nephritis are characteristically associated with a lowered alkali reserve. There is a lowered p_H in fasting, anesthesia and pregnancy.

The remainder of the meeting was turned into a general discussion of the many facts presented. Many members voiced their appreciation of the masterly presentation of the subject.

The meeting was closed with a rising vote of thanks to Dr. Hanke for his very interesting discussion.

MAY.

The 207th meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, May 17th, at the University of Illinois School of Pharmacy. The meeting was presided over by President R. E. Terry.

Chairman Gathercoal, of the Revision Committee of the National Formulary, discussed "Progress in the National Formulary Revision Up to Date." Mimeographed bulletins were presented to the members present so that they could follow the discussion closely. This bulletin gave a very interesting review of the history of the inception of the National Formulary and of the revisions up-to-date.

GENERAL PRINCIPLES OF REVISION.

Naturally, the General Principles of the N. F. are patterned rather closely after those of the U. S. P., and yet there are some striking points of difference. This can be nicely illustrated by reference to General Principle No. 1 on Scope. In the Pharmacopœia the admission of drugs and medicines is based first upon therapeutic usefulness and pharmaceutical necessity, and secondly upon extent of use. In the National Formulary admission is based almost entirely upon extent of use. The National Formulary very carefully avoids including any of the formulas as well as drugs or chemicals that are recognized in the U. S. P.

A very important change has been introduced into General Principle No. 1 by the introduction of the following phrase: "and for such other medicinal materials as are frequently called for in the pharmacies of the United States." Heretofore, no medicinal chemicals or drugs could be included in the N. F. unless the same were used in some formula in Part I. Now it will be possible to include such non-U. S. P. items in the N. F. even though they are not used in a formula in Part I.

PRESCRIPTION INGREDIENT SURVEY.

Numerous surveys were made of the prescriptions written in wide-spread sections of the country. The extent to which the items

were used gives a basis to work on for admission and deletion. Therefore, we have used as a guide in the consideration of items for admission to N. F. VI, a usage in at least 20% of the 60,000 drug stores and hospital pharmacies of the United States, or a usage of at least once in each 10,000 prescriptions.

As to new items for N. F. VI, there will be probably 100 items dropped from the U. S. P.; possibly more than this. Then we now have under consideration more than 400 items that are unofficial—so we shall be able to easily replace, in part at least, the 280 N. F. V items that have been dropped. Among the new items already admitted to N. F. VI are a considerable number of ampuls. A number of new Elixirs and Syrups are under consideration. Tablets and capsules are also being considered for N. F. VI. A few new vegetable drugs and a number of new chemicals are also being considered for admission.

ACTUAL PREPARATION OF THE MONOGRAPH.

(*a*) The first step toward the revision of a monograph or the preparation of a new one is its assignment to a Sub-committee. There are nine Sub-committees.

(*b*) The Sub-committee first gives general consideration to the preparations as a group, to the general form of the monograph, the general style of the definition and rubric, the general plan of the formula and any changes in the general character of the description, the tests, the assays, etc.

(*c*) The chairman of the Sub-committee then assigns to each member of his Sub-committee certain preparations which the member will especially study. All of the Sub-committees have made such assignments of monographs for study, except one or two who are going about their work in a different way.

(*d*) Reports are received from these Sub-committee members by the chairman, who then presents the first revision of the monograph in his Sub-committee Letter.

Practically all of the fifty chemical monographs have been presented to the Sub-committee and likewise more than half the Solution Preparations, and a considerable portion of the other monographs have gone forward to their respective Sub-committees.

(*e*) Sub-committee members comment upon this revision and these comments are then published by the Sub-committee chairman in his Sub-committee Letter. Eventually the Sub-committee recommends to the General N. F. Committee the monograph as accepted by the Sub-committee.

(*f*) The monograph is then published in the *N. F. Bulletin* for consideration by the Committee members and all others who receive the bulletin. About 150 monographs have appeared in the *Bulletin* and are now before the N. F. Committee.

(*g*) Comments may come from Government officials, laboratory men of pharmaceutical and chemical manufacturing firms, and college of pharmacy men, as well as from the Committee members. Such comments are all published in the *N. F. Bulletin*, and hundreds of them have been received and so published in the last few months.

(*h*) After the monograph has been published in the *N. F. Bulletin* it is taken up for consideration by the Sub-committees on Posology, on Nomenclature, on Chemicals and Chemical Tests and possibly on Botany. Reports from these Sub-committees are received and published in the *N. F. Bulletin*.

In the present N. F. revision none of the monographs have advanced beyond this point, but we can give a general picture of their subsequent progress from a review of the work of previous revision committees.

(*i*) The revised monograph will be presented again to the General N. F. Committee by the chairman, and further comments called for. As long as reasonable suggestions for change are made the monograph will be repeatedly presented to the Committee, either as a whole or as a vote on the individual comments or suggestions.

(*j*) When no further suggestions are offered on the revision of the monograph it will be presented for publication in the JOURNAL OF THE A. PH. A., and thus be exposed to criticism from any interested person.

(*k*) Finally the monograph will be subjected to very careful scrutiny by an editorial committee. An experienced English grammarian will review it for grammatical construction. Others will check it for uniformity in style, for posology, for assay, for Latin titles, etc., until it has been whipped into as nearly perfect shape as possible.

(*l*) The carefully copied completed monograph will then go to the printer.

(*m*) Galley proof will be submitted to all members of the Committee and those receiving the *Bulletin*. In the galley proof, if previous experience is any criterion, many more corrections will be made.

(*n*) Each of these suggested corrections must be carefully considered either by the N. F. Committee or the editorial committee and then the corrected galley will go back to the printer for the page proof.

(*o*) Usually a first and a second page proof must be prepared and read before the copy goes to the Publication Committee of the A. PH. A.

(*p*) This Publication Committee gives it the final O. K. before it goes to the printer for actual printing and binding.

(*q*) And then the completed volume appears upon the market and the real criticisms from the pharmaceutical public of the world finally begin to appear. We hope there will be no errors in typography, spelling, in English construction, in incorrect figures, etc., but we are very confident that there will be many criticisms on the scope of the book, the General Principles by which it has been revised, the style and arrangement of the monograph and of the compromises that the N. F. Committee is forced to make to bring its work to a final fruition.

Dr. Bernard Fantus spoke on admissions to the N. F. He stated that facts are being accumulated as to the use of drugs. These figures will serve as an estimate of the use of these drugs and formulas. No other country has the peculiar division between the scope of the two books; the U. S. P. is aiming to guide the physician in the use of the best drugs and preparations. The future U. S. P. will aim to have only the best preparations of each drug official so that the doctor can depend upon this preparation as being recognized as the best and will not become confused as to which preparation to use as is now the case. Preparations omitted from the U. S. P., if still used, will always be found in the N. F.

Prof. Hynes discussed the simplification of titles. He attributes the lack of popularity in comparison with the merits of U. S. P. and N. F. drugs and preparations to their cumbersome titles. He advised simplification of nomenclature so that titles can be mastered by medical students, physicians and druggists.

The meeting was closed with a general discussion and the extending of a vote of thanks to Prof. Gathercoal, Dr. Fantus and Prof. Hynes.

LAWRENCE TEMPLETON, *Secretary*.

DETROIT.

The May meeting of the Detroit Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was preceded by a pharmaceutical conference arranged by Dean Edward H. Kraus and his staff. This was a new idea and proved to be a great success. It is planned to repeat a similar program next year.

The Conference speakers were all members of the faculty of the University of Michigan. The attendance was materially increased by the students from The College of the City of Detroit and the Detroit Institute of Technology.

The A. PH. A. Branch meeting was called to order by President James Liddell and on motion of Fred Ingram, Jr., the minutes of the previous meeting were omitted inasmuch as they were printed in the JOURNAL.

Dean Edward H. Kraus, Chairman of the Nominating Committee, reported the following nominees for officers for the ensuing year: *President*, Robert Fleisher of the Detroit Institute of Technology; *First Vice-President*, Felix Johnson of the University of Michigan; *Second Vice-President*, Eugenie Lemke; *Student Council*, Arno Wheeler and Alfred Lavalli of the Detroit Institute of Technology; W. J. Briggs and A. C. Edmunds of the College of the City of Detroit; John Lambrinoff and C. A. Halm of the University of Michigan; *Council of Clerks*, David Millstin and Albert J. Liss; *Chairman Program Committee*, R. T. Lakey; *Treasurer*, Fred Ingram, Jr.; *Secretary*, Bernard A. Bialk, the latter two required no vote as they are permanent officers of the Branch.

On motion of Leonard A. Seltzer, seconded by Dean R. T. Lakey, the secretary was instructed to cast unanimous ballot for the Branch, electing the above nominees to office. Carried. The ballot was cast as instructed.

President James Liddell then introduced the speaker of the evening, Dr. James D. Bruce, *Director* of Department of Post-Graduate Medicine and *Vice-President* of the University of Michigan. Dr. Bruce gave a very interesting talk on "The Responsibility of the Medical and Pharmaceutical Professions for the Health of the People." In his talk Dr. Bruce took to task the dispensing physicians, claiming they were the chief offenders in substitution because they cannot carry a complete stock and the patient may receive a substitute if the correct medicine is not in the doctor's stock. Closer coöperation between pharmacy and physicians was urged for eliminating this evil.

Fred Ingram, Jr., made a motion to thank the speaker for his interesting talk and to thank

Dean Kraus for the illuminating program presented during the day. The motion was supported by Leonard A. Seltzer and carried by rising vote. Mr. Seltzer moved a vote of thanks to the officers of the Detroit Branch for their splendid work throughout the year.—Carried.

Retired President James Liddell expressed his appreciation of the support given him and urged that the students carry on in a manner that would continue to justify the confidence placed in them.

BERNARD BIALK, *Secretary.*

UNIVERSITY OF FLORIDA STUDENT BRANCH.

The fifth meeting of the University of Florida Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held May 18th, in the Chemistry-Pharmacy Building.

The meeting was called to order by President Katsch.

Mr. Johnson presented to the Society a plan for a membership campaign to be conducted during Freshman Week at the beginning of the Fall session. Mr. Johnson and several members to be selected by him are to interview the Pharmacy freshmen who will be under the supervision of E. F. Bradley, Freshman Councilor. This plan was approved by the Society.

The secretary read a letter from Dean B. A. Tolbert, *chairman* of the Faculty Committee on Societies and Fraternities, stating that this Branch had been officially recognized as a student organization on the University of Florida Campus.

The president next introduced the speaker of the evening—Dr. P. A. Foote, professor of Pharmacy and Pharmaceutical Chemistry, U. of F. The subject of Dr. Foote's talk was, "The Sponge Industry in Florida."

Dr. Foote gave an interesting account of the history of the sponge industry, and of the Old World customs, both religious and social, still followed by the Greeks who at present control the sponge industry in Florida.

Sponges are members of the animal kingdom, and are found firmly attached to rocks in the bottom of the sea at a depth of from a few feet to several hundred feet. There are at present about one thousand known species of sponges, but only a few of these are of commercial importance. They reproduce by throwing out spores which become attached to rocks and grow. From one to six years are required for a sponge to reach a market size.

Florida produces four commercial varieties of sponges: The wool sponge is the highest grade and has a very wide use in surgery and pharmacy. The yellow sponge and the grass sponge are handled by drug stores, but have no use in pharmacy The first is used as a bath sponge and the second is used for washing cars, etc. The wire sponge is the poorest grade and is used for very rough work.

There is a variety of sponge, the logger-head, which grows abundantly in Florida waters and at present has absolutely no commercial value. It is very tough in texture, grows flat along the ground, and is enormous in size—usually from ten to twelve feet in length. Work is being done with this sponge by Dr. Foote and Dr. Heath, professor of Chemistry, and it is thought that it has wonderful commercial possibilities.

Little is known of the chemistry of sponges. They contain a very high per cent of nitrogen—especially the fresh sponge. They are very resistant to most of the organic and inorganic solvents, but are readily dissolved by solutions of sodium and potassium hydroxides. They are practically fire proof. The amount of iodine in sponges has never been determined.

A number of interesting pictures and slides were shown.

A. P. MCLEAN, *Secretary.*

NEW YORK.

The May meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, which featured "The National Drug Store Survey," was held at the College of Pharmacy, Columbia University, on Monday the 9th, the chair being taken by President Robert P. Fischelis; there was an attendance of about 150.

Owing to the length of the scheduled program, the reading of the minutes was dispensed with.

Treasurer Currens' report was read and accepted.

The secretary reported the applications for membership in the parent organization of Messrs. I. L. Fishbein and B. Esecover and of A. Seiler for membership in the Branch. These applications were approved.

Secretary Schaefer, of the Remington Medal Committee, reported that the Committee of Ex-Presidents of the A. PH. A. had awarded the 1932 Remington Honor Medal to Editor

E. G. Eberle of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION. President Fischelis said that he felt the members of the ASSOCIATION and the Branch would be very pleased that Editor Eberle was to be the recipient this year. It was decided that the time and place for the award to be made should be left to the discretion of the officers of the Branch.

The secretary then read a letter from Dean Hugh C. Muldoon, written on behalf of the Conference of Boards and Colleges of District No. 2, N. A. B. P., in which he expressed cordial thanks to the New York Branch for the entertainment provided during their recent meeting in New York City.

Dr. Otto Raubenheimer presented a joint-paper prepared in conjunction with Mr. Alfred Bonvicino on "The Official Pharmacopœia of the Kingdom of Italy." The Pharmacopœia, which went into effect on November 1, 1929, was compiled by a committee of 19, consisting of 3 retail pharmacists, 1 veterinarian, 3 professors in medical schools, 6 professors in pharmacy schools and 6 public health officers. In the preface, attention is directed to certain important matters; among them are the following:

"For the tests and reactions, with the name of Hydrochloric Acid, Sulphuric Acid, etc., without other indication, it is intended that the *Concentrated* acid of the Pharmacopœia be used.

"If a prescription is written for Hydrochloric Acid, Sulphuric Acid, etc., without other designation, the *Dilute* acid must be dispensed.

"The indication 'Preserve away from light' signifies that the substance must be preserved in opaque vessels or in black, red, orange or brown colored glass.

"For 'alcohol' without other indications the 95% alcohol must be given.

"By ordinary temperature 15° C. is understood.

"The drops, according to the ruling of the conference at Bruxelles, must be measured with a dropper with a round orifice, with a diameter of 3 millimeters, so that 20 drops of distilled water weigh 1 gram at 15° C.

"Maceration and percolation, unless otherwise indicated, must be made at a temperature of 15–35° C., digestion between 35–65° C., infusions with boiling water, decoctions by boiling the drug with the water for half an hour.

"Solutions of drugs for hypodermic or intravenous use, must be sterilized, even though it is not specified by the prescribing physician. The process to be followed varies according to the substance to be sterilized."

Drugs which must be renewed annually are listed. Among the interesting articles deleted are Phenol Water, Pancreatin, Carlsbad Salt and Paregoric; newly admitted articles include Digitoxin, Strophanthin, Rhamnus Frangula Cortex, Viburnum prunifolium Cortex, Boldi Folia, Black Pepper, Barium Sulphate, Chloretone, Luminal, Atophan, Novocaine, Salvarsan, Citroform and Tannigen.

Dr. Raubenheimer discussed the arrangement of the monographs on Botanicals, Chemicals and Galenicals; under the General Chapters, he mentioned that Fluidextracts were made by the four Type Processes laid down in the U. S. P. The Pharmacopœia gave working formulas for the preparation of over a dozen chemicals; information of this type was no longer given in the U. S. P. He referred to titles which might be confusing to the American pharmacist; he compared the strengths of the acids, alkalis and solutions with those corresponding to them in the U. S. P. He finally discussed at length the Tables in the Pharmacopœia, the following being of special interest: official titles and commercial or trade-mark names; medicines which must be kept on hand; those which must be kept under lock and key; those to be kept away from light; substances only a pharmacist may sell, those anyone may sell; maximum single and daily adult doses; single doses for hypodermic injections and solvents; daily maximum veterinary doses.

The president thanked Dr. Raubenheimer for his interesting paper, and he was warmly applauded.

President Fischelis briefly outlined the importance of the National Drug Store Survey and the St. Louis Conference, the work of which was to be under discussion for the remainder of the evening's program. He called upon Mr. J. J. Toohy, of E. R. Squibb & Sons, to speak on "Promotional Methods of the National Distributors." Mr. Toohy addressed the meeting as follows:

"The most impressive reaction I received at St. Louis was the voluntary gatherings for the first time of over 800 representatives of every conceivable interest in the drug industry in one united effort to learn how the wheels

go round in a retail drug store and to see what can be done to make them go faster."

The roll call listed retail druggists of every size and type, the independent retailer, the professional pharmacist, the national chain store operator and the local chain operator. The wholesaler was there, the manufacturer, the educator in pharmacy, the Drug Trade Press, and that department of the Government most directly concerned with the development of American enterprise.

Is it not reasonable to hope that out of such a community of interest, narrow views will evaporate to leave as a residue a broad understanding and an appreciation of the other fellow's viewpoint and problems?

Manufacturers will learn the real operating costs of retailing and retailers will learn that a gross margin per unit of sale is not the only basis on which to judge a manufacturer's product.

The next most impressive reaction was the field work itself. The business specialists of the Department of Commerce labored over a year in their search. Their observations can be said to be as accurate and as fair as human behavior permits. Some conclusions may require adjustment in the light of later facts, especially those developed in the checking of the survey results in other cities, but the St. Louis sample shows trends that compel the attention of the drug industry.

No manufacturer or group of manufacturers could have assembled the facts recorded. Even if finances were unlimited, no manufacturing group could secure the coöperative effort required. You who sell and understand what a drug store inventory is, could probably raise a just doubt over the labor involved. Three complete inventories of every single article of merchandise in 13 stores were taken. Every nickel's worth purchased by these 13 stores for a whole year was recorded. An inventory of products affected was taken at every price change—and that means every sale and every price change induced by any reason. Time studies were taken of all retailing operations. 30,000 actual retail transactions were listened to, clocked and the consumer and his reactions were recorded.

What does a national distributor see in the St. Louis Drug Store Survey? *First*, although of secondary importance, is the data about his own market.

Manufacturers are quite aware of at least one weakness in our position. Our relationship with the consumer is too indirect—principally secured by our representatives in conversation with dealers.

The consumer's interest is not in the price and profit issue which is our primary relationship with the dealer. The consumer's concern is the perfection of product to meet his wants, the appeal of package and advertising and a convenient source at a fair price.

The manufacturer must reach the consumer through direct advertising in all media, and through display and salesmanship at the point of sale; when you reflect that manufacturers in the drug industry spend over $35,000,000 in national magazines alone, or 2% of the total sales, and realize that practically no manufacturer deals directly with his biased facts concerning his market.

Secondly, he sees eye to eye with retailers on such points as

1. The story of the prescription department as outlined in the Department of Commerce booklet called "Prescription Department Sales Analyses in Selected Drug Stores." The essence of this is that the prescription department is the nucleus, the prestige department of the drug store, and that there is no reason it should not be a mighty profitable department.

2. The retail drug store is largely a metropolitan institution. The per capita purchase in retail drug stores, according to the Census of Distribution in metropolitan areas, is many times that of nearby rural areas. St. Louis in 1929 had a $22.40 rate against $1.60 in one county in the St. Louis wholesale district. The message here is the intensive development of metropolitan markets.

3. A large part of drug store volume is derived from satisfying the casual impulse of the passerby. Consequently, a large part of the demand for drug store merchandise can be stimulated by various methods of promotion.

4. Men use the 13 test stores more than women and buy more. The department store market in St. Louis may have a bearing on this unusual observation, but at least this trend demands close checking and very likely a shift in selling appeal.

5. The average sale is about 35¢. The drug store is therefore dependent on many small purchases with small profits. Repeat sales from the same customers are important, especially in neighborhood stores. Store prestige must be established. The price appeal is overdone, and no longer needs the emphasis

it gets. The consumer wants value and he can be sold quality, convenience and interested personal attention.

6. Consumers seem pretty well acquainted with the loss leader appeal. On a sale day, the store does a splendid volume—on the loss leaders. Normally 9.5% buy more than one item. On sale days 9.9% buy two items, or more, which represents a very slight increase. But, on sale days only 8.4% buy a non-sale item with a sale item, showing a suspicion of the merchandise on which the dealer hopes to make up his loss.

7. Brand specification is as high as 95% in aggressive merchandising stores where the low-cut appeal is strong, but in the conservative neighborhood store, brand specification drops to about 60%.

8. Operating costs vary according to the department and to the commodity sold. Gross margin is so commonly used as a basis for judging a dealer's interest in a product, that many retailers complain when the margin is less than the average gross margin for all items.

Four factors affect net profit: Gross Margin, Turnover, Unit of Sale, Special Handling Requirements. Misunderstanding is bound to creep in when exclusive reliance is placed on any one of these factors.

9. The average retail drug store does not practice aggressive merchandising and is not fully capitalizing the demand created by national advertising. This aggressive merchandising does not mean high pressure advertising or clubbing every customer to buy something else. It means organizing and sales planning such as

a. Orderly and effective store arrangement.
b. Attractive window and counter displays, co-relating these to national advertising schedules, which any newspaper will supply.
c. Attractive special sales which are timely, novel and thoroughly planned.
d. Handbill or direct mail advertising that is unquestionably fitted to that store rather than a stereotyped plan that may fit an average store but not yours.
e. The use of a quantity price appeal, 3 for 49¢, has been proven to be more effective than 1 for 14¢.

These trends cannot and should not be accepted by every retail operator in the country as absolutely literal, but they represent facts that point out lessons to manufacturer and retailer.

In the third place, the manufacturer is deeply concerned and thoroughly interested in the accumulation of facts on retail drug store practice prepared for retail drug store consumption. Not only must the drug industry understand itself, but, particularly, the retail outlet must operate profitably and justify itself economically. The manufacturer has, of course, the selfish interest that his best customers are retail operators.

Another obvious point is, a good retail druggist is always a better distributor for a manufacturer than any hired retail distributor employed by the manufacturer.

Manufacturers should accept their share of the responsibility of spreading the story of the National Survey throughout the industry, helping to test the results in every local area, and disseminate all information available on this Survey and others which may be founded on it throughout the industry.

The next speaker was Dr. J. Leon Lascoff, who as a Retail Pharmacist took part in the St. Louis Conference in discussing a paper on "The Prescription Department," compiled by F. A. Delgado of the U. S. Department of Commerce. Dr. Lascoff spoke as follows: "The National Drug Store Survey Conference was one of the most interesting and worthwhile meetings I have ever attended. About 700 people were present. Among them were quite a number of retail pharmacists. Seven speakers addressed the session dealing with the prescription department, on which portion of the conference I have been asked to speak to you to-night. Due consideration was given by the Survey to the professional side as well as to the commercial. A very able report was given by Wroe F. Alderson on the general results of the Survey and a report of the prescription department in particular was given by Frank A. Delgado. Both gentlemen are associated with the U. S. Department of Commerce. As time does not permit me to cover Mr. Delgado's entire report, I have summarized the important points presented by him.

"A detailed study was made of 24,000 prescriptions, their ingredients, etc. Of these it was found that the bulk of the ingredients used were official, that is, listed in the U. S. P. or N. F. This information should be of value to the pharmacist in building his prescription stock.

"There were then presented some of the answers to the questions most frequently asked regarding the prescription phase of the Survey.

"*1.* What percentage of drug store volume is accounted for by the prescription department? This was found to represent nearly one-fifth of the total sales volume, combining both prescription and non-prescription sales made out of the prescription department.

2. What other possibilities are there to increase prescription department sales that will keep the pharmacist busy and allow him to exercise his professional knowledge? The pharmacist has an average of from 900 to 2200 different drugs, galenicals, etc., from which only approximately 500 to 800 are actually employed in filling prescriptions.

3. What sales other than actual prescriptions are made from the prescription department? A check was made for 50 days in Store 1. It was found that 1830 non-prescription sales, or an average of 36 such sales per day, were made. The average value per sale was 27½ cents, or $504.77 for the 50-day period.

4. How can the pharmacist attract attention to his prescription and professional departments? Display those old symbols of pharmacy, the gilded mortar and the show globe, together with some educational or professional windows. Do not make these displays only once a year, on National Pharmacy Week, but have them often.

5. What was the average minimum and maximum number of prescriptions filled per day? The 13 stores filled an average of 15 prescriptions per day.

6. Did this include refills? There was an average of approximately four refills per day. This number varied. Those stores that had been in business for a long time usually led in refills.

7. What was the maximum number of prescriptions filled per day? Four of the stores filled approximately 20, 22, 31 and 40 prescriptions per day.

8. What was the minimum number of prescriptions filled? Three of the stores filled from 6 to 7 prescriptions per day.

9. What was the average price charged for all prescriptions? This was $0.92.

10. What were the average prices charged for new and refill prescriptions? New prescriptions averaged $0.95 each and refills averaged $1.00 each.

11. What was the usual price charged for prescriptions? Over 57% of the 24,000 prescriptions studied were priced at from $0.75 to $1.00. Approximately 20% were priced from $0.50 to $0.70. 18% at from $1.05 to $1.50, and 4% at over $2.00. This makes only 21% priced at over $1.00. Narcotic prescriptions were generally priced somewhat higher than the non-narcotics.

12. Were there any examples of abnormally low-priced prescriptions? 610 prescriptions, or 2½% of the 24,000 were priced at less than $0.50. Of these 610 prescriptions, 565 were non-narcotic and 45 were narcotics. 19 prescriptions were priced at $0.10; 55 at $0.25; 39 at $0.30; 159 at $0.35; and 338 at $0.40.

13. Were there many prescriptions selling for over $2.00? Only 95 sold for $2.00 or more, with the average price from $2.00 to $4.00.

14. In what form are prescriptions in greatest demand? 61% of the prescriptions were liquids. The second most popular form was capsules, which comprised 17½%. Tablets were used in 10% of the prescriptions. Therefore these three forms—liquids, capsules and tablets—accounted for about 89% of all the prescriptions. Four were ointments; 3% were divided powders; 1½% were bulk powders; 1⅓% were effervescent salts; 1% was for pills; ⅓ of 1% suppositories. The remaining ⅛ of 1% was divided among konseals, plasters, globules, pearls, crude drugs, etc.

(Liquid prescriptions in the U. S. averaged 4 ounces each, and 61% of all prescriptions filled were liquid.) It would appear from these figures, and from the estimates as to the number of prescriptions filled, that production in the retail drug stores would amount to approximately one million gallons.

15. Is it true that the compounding of prescriptions has become a mere pouring-out of a liquid from one bottle to another, or counting out a certain number of pills or tablets? Just the contrary is indicated. 65% of the prescriptions call for more than one ingredient; over 4% called for 6 or more ingredients.

16. What percentage of the number of prescriptions studied were written in the metric system? Only 7½% were so written.

17. How many items were stocked in the prescription department and what proportion of the total did they account for? While 5070 items were stocked for the store as a whole, 1500 or 29% of them were in the prescription department.

18. Will it be possible to show the total amount invested in the inventory of the pre-

scription department of each store? Figures for 4 stores show that the prescription department accounts for 1/6 of the total inventory. In other words, there is an average prescription stock inventory of $1140 against $6800 total inventory.

19. How is the prescription inventory investment divided?

30 to 38% were specialties.
24% were galenicals, not including tablets.
11 to 14% were chemicals.
4% were biologicals.
5% were glandular products, some of which were specialties.
2% were essential oils.
2½% botanical drugs.
2% ampuls."

The above comprises a very brief summary of Mr. Delgado's report. In its original form it covers 12 pages of typewritten matter not including some very interesting analysis tables.

After Mr. Delgado's report, the discussion was led by a group which included two pharmacy college professors and four retail pharmacists from various sections of the country.

Dr. E. Fullerton Cook mentioned, among other things, that there should be a separation of the professional pharmacies from the merchandising drug stores. Such a separation exists in Europe where we find the apothecary shop and the "druggerie."

The report entitled "Facts on Retail Operating Costs and Mark-Up for Profit as Applied to the Prescription Department" was read by Dr. Lascoff. He, at this point, read excerpts from this report and in conclusion said "to answer the question as to whether or not a prescription department pays, I say, without reservation, 'Yes.' For I never heard of a pharmacist who lost a customer because his prescription department was too clean. I never heard of a pharmacist who lost the confidence and good-will of a physician because he used the best chemicals and galenicals that money could buy, and who equipped himself in every way to work side by side with the physician in the relief of those in distress. Finally, I never heard of a pharmacist who went into bankruptcy because he knew what each prescription cost him and who charged a fair price comparable with the skill and knowledge required of a professional pharmacist."

The president then called upon Robert W. Rodman, Associate Editor of the *Druggists Circular*, to discuss the report on "Retail Advertising and the Special Sale," as submitted by Nelson A. Miller before the St. Louis Conference. Mr. Rodman said, "When the Department of Commerce investigated the advertising activities of the retail druggist as a part of the National Drug Store Survey at St. Louis, it turned the spotlight upon a most important phase of the retail drug business which affects every department of the store and yet one which is most often neglected by the druggist.

The survey revealed three important weaknesses on the part of the retailer.

1. He is taking little advantage of the selling support offered by the national advertising of pharmaceutical manufacturers.
2. He is doing little or no advertising of his own, and
3. The only type of prestige which those who are advertising are attempting to develop is *price prestige*.

During the year 1930 the 35 leading consumer magazines in this country carried nearly 15 million dollars worth of advertising on toilet goods, 5 million on proprietary medicines, 2 million on sundries, about ½ million on hospital goods and 128 thousand on confectionery. Millions of lines of advertising of this merchandise were carried by daily and weekly newspapers during the same period.

Yet the retailer made practically no attempt to tie-up with these campaigns even with window and counter displays. These millions of dollars were spent to increase the sale of merchandise which the druggist has upon his shelves and presumably is eager to sell, yet he made no effort to cash in on this promotion at the point of sale but rather sat by and waited, hoping to get a few crumbs of the business after other retail outlets for this same merchandise had helped themselves to what they wanted.

Chain organizations plan, so do successful independents. They make the most of every opportunity to increase the effectiveness of their selling efforts. This is the first condition revealed by Mr. Miller in his studies—one which can be remedied by many druggists at no expense and one which should be remedied by them at the first opportunity.

Retail druggists are doing little or no advertising of their own and the only type of prestige which those who are advertising are attempting to develop is price prestige. Under this classification of advertising we find not only newspaper copy but handbills, letters

to customers and physicians, stuffers to be wrapped in packages, and other forms of promotional material.

Advertising in some other retail lines is directed to a considerable degree toward building the prestige of the retail concern itself. Points of emphasis include the services of the store, its reputation for fair dealing or its general policies. Although the services of the retail druggist are particularly well adapted to such promotion, drug advertising is largely on a commodity basis with an emphasis upon price appeal. The usual drug store advertisement is simply a listing of products and prices without comment except for a few words pointing out the sensational character of the price cuts offered.

The Survey clearly shows the need for retailer education in advertising. In my opinion it calls for the preparation of an advertising guide for the retail druggist which will show him what to spend and how to spend money for promotional activities.

When we speak of choosing a location with certain definite conditions in mind or of rearranging the fixtures of a store to fulfil certain definite requirements, the average druggist readily understands what we are talking about and with a little guidance is able to go ahead, but when we speak of composing a booklet or of writing a promotional letter to go to customers or physicians he feels we talk of something intangible which is foreign to his ability through either training or experience. Advertising is a specialized activity demanding training and experience. The druggist cannot be expected to be a skilled professional man, a merchandising expert and an advertising specialist. He must be shown in elementary form, by models, just how to wage an advertising campaign and gradually by using these models he will acquire the ability to design more distinctive advertising materials of his own. He must be encouraged in attempting to obtain prestige for his service, dependability, reliability, etc.—elements which pay far greater dividends than do cut prices.

A major reliance of the retail druggist in his merchandising effort must continue to be his display windows. While many pharmacists feel that the window has no particular pulling power the Survey has developed evidence that even the ordinary type of window is inclined to produce a gentle sales stimulation difficult to observe but possible of measurement.

It is unreasonable to expect results from a haphazard schedule of window displays, however. The druggist should take into consideration the type of customers who pass his store in planning his displays. A window of one article of merchandise which will prove a great stimulator of sales in one store will fall flat in another store because of neighborhood conditions and the variance in type of customers served. A plan is needed to insure a fair representation throughout the year of each department of the store in the windows—from the prescription department to the soda fountain.

The special sale is presumably intended to increase the total volume of store business, according to Mr. Miller, but it is doubtful whether it accomplishes this purpose when the effect over a period is considered. The main effect seems to be the concentration of business on the sales day and its reduction on non-sale days because of the tendency of customers to wait for sales. The special sales event has become the predominant tool of aggressive drug store merchandising, yet in effect it defeats the primary purpose for its use. Rather than bringing customers into the store by cut prices on nationally advertised items for the purpose of introducing controlled brand merchandise it serves mainly to increase the volume on merely the special sale items at little or no profit or even a loss. Customers enter the store with prepared lists of merchandise which they want and the peaks of operation of the day are so accentuated that sales clerks actually have less opportunity to suggest additional purchases or companion items than normally. If such is attempted the store service is delayed, the sale acts as a detriment to the store, and regular customers in many cases are lost. Attempts at switching during a special sale are almost suicidal, for customers feel that they have been tricked into coming to the store. They will have a hard time trying to obtain the products they want and their sales resistance is built up stronger than ever.

Special sales do not make people buy more merchandise but rather to make their purchases where the prices are lowest and correspondingly at little or no profit to the dealer.

When your secretary invited me to address your meeting to-night he restricted me to the subject of "Retail Advertising and the Special Sale," but I cannot close without a word or two on the work as a whole.

Many druggists will profit as a result of the National Drug Store Survey and others may lose by its work. Those who profit will be the druggists who study the findings and adapt them to their businesses. Those who lose will be the ones who allow their more progressive and aggressive neighbors to take away from them even more trade than heretofore. If all used the facts and profited by the Survey, the drug business would receive such an impetus as would make many of its non-druggist competitors give up their drug lines and would make many of those who have been thinking of stocking drug lines turn to other fields. Every druggist will be affected by the Survey whether he makes use of its findings or allows his competitor down the street to do so.

The thousands of dollars thus far expended in the work, the thousands of hours of study, the plans, the estimates, the voluntary work of the hundreds who have contributed ideas, and the large sums yet to be spent will all have been wasted unless druggists make use of the Survey findings.

No fairy queen, with a sweep of her wand, is going to revolutionize the drug business. Legislation, surveys, journalistic suggestions and the rest are effective helps, but it is the man himself, for whom all this effort is made, who must do the actual work. Competition to-day, perhaps more than ever before, is a case of the survival of the fittest. Pharmacists must face the facts, figuratively as well as literally, and realize that they themselves must improve the conditions under which they labor. For those who are sincere in their desire to succeed, the National Drug Store Survey will prove of valuable assistance."

President Fischelis welcomed Wroe Alderson of the United States Department of Commerce, who was the Director in charge of the St. Louis Survey.

Mr. Alderson said that the National Drug Store Survey was an attempt on the part of the Department of Commerce to collect more facts concerning drug store merchandising than had ever been collected before. It was apparent that no industry at the present time would be able to pull itself out of the depression without the whole-hearted coöperation of all parties concerned. At the St. Louis Conference there were together for the first time representatives of every section of the drug trade who were working on the vital problems confronting the drug industry and all felt that something was being accomplished. All branches of the trade were suffering from a common malady which was due to continuous elaboration of competition; the symptoms of this were revealed by the Survey. The chain store at the present time was a sick institution because of going into competitive bidding for locations; this had forced it into extreme practices of merchandising. Drug manufacturers in many cases in the past had felt that it was only necessary to get their products before the public for the retailer to be forced to handle them, whether there was any profit in them for him or not; to-day manufacturers were realizing that it was essential for everyone handling the product to make some profit. The investigators tried to discover in the Survey what items were profitable for the retailer to handle; they found that there was no escape from the necessity of merchandising, whether the druggist conducted a strictly professional or a commercial store.

Mr. Alderson summarized the six most important findings of the Survey as follows:

"*1.* The retail drug trade, with a few notable exceptions, does not engage in aggressive merchandising, and hence is not fully capitalizing its opportunities for the creation of demand.

2. The essential basis of aggressive merchandising is organization and sales planning, rather than high-pressure tactics in advertising or the sales interview.

3. A re-direction of retail sales effort is suggested by the predominance of men among customers, by the small number of multiple sales, and by observed consumer reactions to sales devices.

4. Location and rental problems are of paramount importance, involving not only the success of the retail druggist but major issues concerning the entire industry.

5. An era of store modernization is overdue because of the many new departments in the drug store which have not been fully assimilated.

6. A basis for pricing from operating cost rather than from competitive considerations is urgently needed and would go a long way toward clearing up some of the issues now vexing the trade."

He said that he considered the last point to be the central theme of the Survey. Too often it was incorrectly assumed that gross profit and net profit were proportionally similar and that a satisfactory gross profit meant a satisfactory net profit, but in many instances

this was not so. There were several characteristics of a commodity which determined what it cost—(1) turnover, (2) size of unit sale, (3) special handling of the product—all of these must be taken into account. When the findings of the Survey were concluded he hoped to present to the retail trade two simple tables from which the druggist in any part of the country, in any type of store, could compute for himself whether a given commodity was profitable for him to handle or not.

President Fischelis called to the platform President Frank A. Blair of the Proprietary Association, a member of the Program Committee of the St. Louis Conference, who said that he had attended over 36 conventions but had never been to one in which the interest of those present was so continuously sustained. The findings of the Survey must be "sold" to the retail druggist and to all branches of the drug industry; meetings such as this one to-night should be held throughout the country so that all might learn details of the work of the Survey and derive benefit from it. Druggists should study their own locations, stores and customers in order to find out what the public would purchase, since the requirements of one locality were often entirely different from those of another. The drug industry had played a very important part in the conservation of the health of the nation, since statistics showed that 50 years ago the country, with a population of 50,000,000, had a death rate of 20.3, while at the present time the population was 125,000,000 and the death rate 11.5. He briefly referred to the work of Mr. Robert L. Lund who had conceived the idea of the Survey and had obtained the coöperation of the Department of Commerce and of all branches of the drug trade.

The next speaker was Harry H. Miller, of the New York Pharmaceutical Conference, who was present at St. Louis; he presented the following paper entitled "A Few Sidelights on the Convention."

"My first thought upon taking up my pen to prepare a report of the National Drug Store Survey Conference held in St. Louis on April 26th and 27th was the utter futility of the task before me. Such a report must of necessity be superficial and, if I can succeed in conveying to you even a vague idea of the ground covered and the constructive thought presented by the various speakers, I will have accomplished all I can hope to accomplish.

I have never, perhaps, attended a convention or conference which delved more thoroughly into the subjects under discussion. Keen analysis was the theme song of the entire proceedings and he who came away with nothing to ponder must indeed have been an inattentative and unappreciative listener.

Here we were given a most comprehensive summary of the data gathered in this Survey which occupied a year's time. Doubtless, some of the facts may not have coincided with our personal observations in our own limited fields of activity but the logic and pertinence of the findings as a whole cannot be denied.

The Survey established itself in my estimation as a success for a myriad of reasons. It has thrown a great searchlight on many of the problems of our profession, which we have been making feeble efforts to solve, and it places within the reach of the humblest of us the results of a research, which none of us singly could accomplish or even attempt to accomplish.

I regret that every man and woman connected in the remotest way with Pharmacy could not be at the Conference but I am glad that a wide audience gained a knowledge of what the Conference was to enjoy, through the radio address delivered by Dr. Julius Klein, Assistant Secretary of Commerce, on April 17th.

Dr. Klein, in his talk, estimated the value of the Survey as follows: "This Survey will bring home valuable lessons of importance to tradesmen in many lines everywhere, because leaders in the drug trade and related industries have already been planning to make its results genuinely effective, not through a spasmodic temporary effort, but with a permanent and far-reaching program all over the country."

Speaking on "Results of the National Drug Store Survey," Wroe Alderson, Survey Director of the United States Department of Commerce, explained what the Survey sought to accomplish and the method of securing data. He said that while much of the material had not yet been analyzed some very significant facts had already been established. He summarized the six most important of these.

"Conservation of Drug Store Assets" was ably discussed by Victor Sadd, Director of Business Failures Studies, Department of Commerce. Financing under adverse conditions, he assigned as the cause of more failures than insufficient capital. Future failures can

best be forestalled, he declared, by preventing the unfitted from entering business and by assisting the efficiency of those in business.

Dr. Frank M. Surface, Assistant Director of Foreign and Domestic Commerce, spoke on the "Aims of Merchandising Research," defining the whole purpose of this particular survey as a desire to help business in a constructive manner.

The matter handled by Dr. Robert J. McFall, Chief Statistician for the Distribution Bureau of the Census, in his talk on "The Census of Distribution and the Drug Trades," was of a nature that called for quiet perusal. Statistical to a great degree, it was an address that one could profitably spend hours studying. This address contained many interesting sidelights on drug store sales, operating expenses, etc.

What the Government is doing for the Drug Industry was explained by C. C. Concannon, Chief of the Chemical Division, who enumerated an almost unbelievable list of activities including censuses, researchers, control of unfair competition, promotion and protection of public health, etc.

Rich in helpful suggestions for the druggist who maintains a soda fountain and a luncheon business was the address of W. H. Meserole of the Department of Commerce, who dealt with the subject in detail, even to the effect of weather conditions on this line of the druggists' business.

In dealing with "The Prescription Department," Frank A. Delgado of the U. S. Department of Commerce, said that every pharmacist should realize that this is his prestige department and the department that establishes confidence for him in the community.

Other splendid addresses on the opening day's program were "Sundries and Hospital Supplies," by John R. Bromell; "Scientific Pricing," by Wroe Alderson; "Proprietary Medicines and Toiletries" by Nelson A. Miller; "The Customer in the Store," by B. B. Aiken; "The Customer on the Sidewalk," by W. H. Meserole; and "Introducing Test Drug Store Owners," by H. C. Dunn.

The importance of store location was the subject of an admirable address by I. K. Rolph on the second day of the Conference. Mr. Rolph is of the opinion that no kind of retail business is more sensitive to good or faulty location than is the drug store. His study of drug store possibilities in central shopping districts, in sub-center, neighborhood development and other locations was highly enlightening.

Many of the fallacies prevailing in the popular mind regarding retail advertising and the special sale were exploded by Nelson A. Miller who spoke on these two matters. The Survey he said, developed plenty of evidence to show that the drug store window still has pulling power. The main effect of special sales, he announced, seemed to be to concentrate business on the sales days and reduce it on non-sales days.

Just what the consumer thinks of the druggist was set forth by E. B. Aiken, who spoke on "Sales Methods and Consumer Reactions." He referred to many of the comments he received through questionnaires filled in by customers. Many a druggist might find the key to his waning business through these answers.

W. H. Meserole placed every importance on "Drug Store Arrangement," which was the subject of his talk. It is his opinion that every drug store should seek three general objectives in their arrangement—general attractiveness, operating ease and efficiency and special promotional advantages.

A good common sense talk toward the country druggist was "Merchandising in the Rural Drug Store," by John R. Bromell. "Retail Selling Prices" were set forth by Wroe Alderson and analyzed in detail.

Speaking on "Accounting and Control for the Retail Druggist," Nelson A. Miller said: "Accounting and Record Keeping is undoubtedly the least appealing task of the retail druggist. At the same time there is possibly no retail outlet with greater need for definite instruments of control." He then proceeded to show how an efficient system of accounting and control may be installed and maintained at a limited expenditure of time and money.

Other addresses which rounded out the final day's program were: "Promotional Methods of the National Distributor," by Wroe Alderson; "Promotion through Modern Packaging," by B. B. Aiken; "Selective Selling by the Drug Wholesaler," by J. R. Bromell.

If this report seems singularly inadequate I can but plead that I have endeavored to my best ability to present to you a blanket report of all that was presented at the Conference with a few meager extracts from some of the highlights. I regret that the limited time at my disposal has permitted me to do no more.

I do desire to say in closing, however, that Mr. Robert Lund and all men of the Department of Commerce and who helped make the Survey are deserving of a great deal of credit; that I believe the Survey has accomplished much good and that if it fails to realize its purpose, it will only fail because the good seed does not find fertile ground. Certainly such an effort deserves our cordial support and I sincerely trust that each and every one of you who comes into possession of literature pertaining to the Survey, will interest yourselves sufficiently to read it carefully. If I were to make one general statement regarding the St. Louis Conference, I think I would say that there was not a single address delivered there which did not contain much meat for thought as well as constructive suggestions which each one of us could find of some benefit."

The president then invited to the platform Mr. Stanley I. Clark, Sales Manager of Lehn & Fink, Inc., and a member of the Program Committee of the St. Louis Conference. He said that the most important benefit to be derived from the findings of the Survey was their application to the everyday problems of the druggist; it had been shown that the prescription department showed the largest unit sale and that the next two important departments were proprietaries and toilet goods. The average independent druggist was not using the promotional assistance that the manufacturer was trying to give him in the way of companion sales. Turnover had been over emphasized; it alone did not solve the druggist's problems; there must be an increase in the unit of sale; by this was meant that a customer usually coming into a store with one item in mind and not in the market for another item must be sold a second item, the selling of which increased the unit of sale and thus gave the druggist a more satisfactory profit than was obtained from a single transaction. It was necessary for all to get a profit from every transaction; this meant careful planning and coördination of sales.

The president now turned over the chair to Treasurer Currens who introduced Chairman Robert L. Lund of the National Drug Store Survey. Mr. Lund said that it was important to bear in mind the fact that this Survey was a job in which every branch of the industry had taken part; the results would not be apparent in a short time, it might take five years or more, but eventually effects would be seen. The Department of Commerce had already published the following three reports which could be obtained upon application—(1) "Drug Store Arrangement," (2) "Prescription Department Sales Analysis in Selected Drug Stores," and (3) "Causes of Failure among Drug Stores;" seventeen other reports would be published before the end of next year. Plenty of material was already available which was of direct practical use to the drug industry. The Druggists' Research Bureau was expected to continue the study of the material gathered by the Survey and to undertake the enlargement of its organization and, with the help of the Committee on Use of the National Drug Store Survey, would take the mass of statistical facts and interpret them into a readily usable form. It was planned to set up demonstration drug stores in different parts of the country to test out the findings of the Survey and these would be an object-lesson for retailers, distributors and manufacturers. It was claimed that every drug store was different and had its own peculiar problems, but the basic principles of merchandising were the same in all. Mr. Lund concluded by saying that the results obtained by the St. Louis Survey had come out of the drug industry as a whole, and he felt that the continued support of those who had taken part, and others in the industry, was assured.

A general discussion followed in which Messers. Gesoalde, Dworkin, Lascoff, Kopald and Seley took part. Dr. Raubenheimer moved a rising vote of thanks to Mr. Alderson of the Department of Commerce and all the other speakers who had contributed to the interesting and profitable program of the evening. This was carried.

HERBERT C. KASSNER, *Secretary.*

PHILADELPHIA.

The May meeting of the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held at the Philadelphia College of Pharmacy and Science, May 10th. The minutes of the April meeting were read and approved, and G. R. Worley was proposed for membership in the Local Branch.

With a short introduction President Stornback introduced Dr. James C. Munch, Modern Danger Fighter, as the first speaker of the evening, who began the report of his recent investigations of thallium poisonings.

Dr. Munch first presented the clinicians, Drs.

Perlman and Pillsbury. They showed the audience some of their patients infected with the common ringworm of the scalp, and the effect of thallium ointment to cause loss of hair in treating this disease. Short talks were given by each of the clinicians on the proper use of thallium ointment, and several questions proposed by the audience were answered.

Dr. Munch then continued his report, giving the actual facts concerning the thallium poisonings that occurred recently in the West, and the details and successful results obtained in using the antidote which he developed.

President Stoneback then introduced Walter L. Morgan, of the Delaware Pharmaceutical Society, who delivered a short address, "Building Up a Prescription Business." A rising vote of thanks was accorded the speakers by the 125 interested listeners.

W. L. Cliffe informed the Branch of the untimely demise of our fellow-member, Dr. John R. Minehart, and proposed that a resolution be included in the minutes. The following resolution was prepared by the committee appointed:

> Dr. John Roy Minehart, Dean of the Department of Pharmacy of Temple University, expired in the Hospital of the University on Tuesday, May 10, 1932, and the Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION directs that the following minute be placed on its record of the meeting held in the evening of that date.
>
> The Philadelphia Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION records with profound sorrow the death of our esteemed friend, unselfish co-worker and beloved fellow-member, John Roy Minehart. We join with those in other walks of life in mourning the loss of one who was ever ready to serve his fellow citizens faithfully and well. A leader in the fields in which he was called upon to labor, he inspired his associates by his devotion to high ethical standards and as an exemplar of proper professional conduct. Those who worked with him uphold in affectionate memory the ideals he so nobly fought for. To his bereaved family we extend our profound sympathy and as an expression thereof, the secretary is instructed to convey them a copy of this minute.

(Signed) W. L. CLIFFE, AMBROSE HUNSBERGER, *Committee.*

The meeting adjourned at 10:30 o'clock, when the members and their invited guests, including representatives of the Delaware Pharmaceutical Society, the graduating classes of Temple University College of Pharmacy, and the Philadelphia College of Pharmacy and Science, enjoyed refreshments served under direction of the Entertainment Committee.

E. H. MCLAUGHLIN, *Secretary.*

PITTSBURGH.

The Pittsburgh Branch and the Pittsburgh College of Pharmacy Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION held their Annual Joint Meeting at the College on Thursday evening, May 12th. President John H. Wurdack, of the parent organization, opened with a few introductory remarks and then turned the meeting over to Robert P. Moore, President of the Student Branch. Mr. Moore, from that point, took up the program and introduced Miss R. Corsello who read an interesting paper on "A Girl Looks at Pharmacy;" Mr. Geer followed with a talk on "Romance and Adventure in Pharmacy;" and Dr. C. Leonard O'Connell, speaking extemporaneously upon the invitation of Mr. Moore, presented a convincing argument for "Psychology in Pharmacy." The guests of honor for the evening were Dr. Julius A. Koch, Dean of the School, and Dr. James H. Beal, Chairman of the Board of Trustees of the U. S. P. Dr. Koch discussed "Present Coöperative Trends," and Dr. Beal spoke on "The Student's Place in Pharmacy." The program was arranged by the sophomore officers of the student organization. The meeting was well attended and was concluded with the serving of refreshments.

The Carnegie Corporation, New York City, has made an appropriation of $10,000.00 toward the maintenance of the library of the Medical College of Virginia, which will this summer be housed in a handsome new building.

Adjoining the new library of the college the Richmond Academy of Medicine has built its home and library. This will contain the famous Joseph L. Miller collection of rare first editions, engravings, silhouettes, medical curios, etc. The headquarters of the Medical Society of Virginia will also be located in the Academy of Medicine building.

EDITORIAL NOTES

Editor: E. G. Eberle, 10 West Chase Street, Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, H. A. B. DUNNING, WILLIAM B. DAY, C. E. CASPARI, J. H. BEAL, W. BRUCE PHILIP, T. J. BRADLEY, AMBROSE HUNSBERGER. *Ex-Officio Members:* WALTER D. ADAMS, *President;* J. G. BEARD, J. W. DARGAVEL, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* THOMAS ROACH, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; E. N. GATHERCOAL, *Chairman,* N. F. Revision Committee; Chairmen of the Sections, A. PH. A.: L. E. WARREN, C. J. CLAYTON, W. G. CROCKETT, ROWLAND JONES, J. T. LLOYD, TOWNES R. LEIGH, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; A. L. I. WINNE, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P. Scientific Section—Board of Review on Papers: *Chairman,* GLENN L. JENKINS, Baltimore, Md.; EDWARD E. SWANSON, Indianapolis, Ind.; W. J. HUSA, Gainesville, Fla.

LET US ASSIST YOU IN SOLVING PRESCRIPTION PROBLEMS.

Dr. S. L. Hilton, former President of the A. PH. A. and Chairman of its Council, well and favorably known pharmacist of Washington, will answer problems that come up in prescription practice. We, therefore, invite those who have problems to send them to this office at 10 W. Chase St.

NOTE:—*May* JOURNAL, *page 523.*

MEMBERSHIP AWARDS IN THE AMERICAN PHARMACEUTICAL ASSOCIATION BY SCHOOLS AND COLLEGES OF PHARMACY.

The JOURNAL OF THE A. PH. A. at 10 W. Chase St., Baltimore, will be pleased to receive information regarding awards made by schools of pharmacy and individuals, awards of memberships or life memberships in the A. PH. A.

The **J. Leon Lascoff** prize life membership has been awarded to Harry L. Handsman, a graduate of the Columbia University College of Pharmacy.

Annual memberships have been awarded to the following: *Duquesne University School of Pharmacy*—for excellence in Materia Medica, awarded by Prof. H. W. Werner, to Wm. Cantelupe, Farrell, Pa.

Excellence in Pharmacy, to Gabriel Di Leonordo, Pittsburgh, by Prof. Wm. A. Jarrett.

For excellence in Chemistry, Rudolph Francis Pierce, N. Braddock, Pa., by Dean Hugh C. Muldoon.

Membership prizes by the *College of Pharmacy, State University of Iowa,* have been awarded as follows:

Teeters Prize, to the senior ranking highest in Pharmacognosy: Mr. Rush D. McKean, Iowa City, Iowa.

Cooper Prize, to the junior attaining the highest rank in practical pharmacy: Irvin V. Wolf, Burlington, Iowa.

Kuever Prize, to the freshman ranking highest in practical pharmacy: Elmer J. Norgaard, Harlan, Iowa.

Scherling Prize, to the sophomore ranking highest in organic chemistry: Miss Karen A. Norgaard, Iowa City, Iowa.

Lindly Prize, to the sophomore ranking highest in botany: Miss Karen A. Norgaard, Iowa City, Iowa.

Membership prizes by the *Massachusetts College of Pharmacy* as follows:

For the best record in all senior subjects, to Charles B. Dunnington.

Pharmacy, offered by Professor La Pierre, and awarded to Mitchell Stoklosa.

Analytical Chemistry, offered by Dean Bradley, and awarded to Charles G. Danielian.

Commercial Pharmacy, offered by Vice-President Ellis, and awarded to Catherine H. Idzikowska.

Materia Medica, offered by President Glover, and awarded to Hyman R. Westerman.

Organic Chemistry, offered by Treasurer Gammon, and awarded to Arpy Arsenian.

Membership prizes by the *Pittsburgh College of Pharmacy* as follows:

Pharmacognosy Prize to Rowland Humphreys Tibbott.

Materia Medica Prize to Luther Bowen.

Pharmacy Prize to Elmer Charles Schlieper.

Applied Pharmacy Prize to Thomas Fairfull.

Chemistry Prize to George Frederick Moreland.

Inorganic Chemistry Prize to Brinley Owens Evans.

Pharmaceutical Economics Prize to Harry John Brumersky.

Physiology Prize to John G. Campbell.

COLLEGE OF PHARMACY, UNIVERSITY OF MINNESOTA.

The College participated in the professional pharmaceutical exhibit at the Minnesota State Medical Association Convention at the Auditorium, St. Paul, during the week beginning May 23rd.

The medicinal plant crop is doing very well. It is somewhat more advanced than is usual at this time of the year. About twenty-five new species and varieties of drug plants and trees have been added to the drug garden, including some Cascara Sagrada and Cactus Grandiflora.

The regular spring meeting of the Northwestern Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held in the Pharmacy building on Tuesday, May 24th. The chief speaker was Mr. Karl Goldner, incumbent of the Minnesota State Pharmaceutical Association 1931–1932 Fellowship, who discoursed upon methods of evaluating aloes, a subject covered by his Masters thesis.

CHICAGO'S 1933 WORLD'S FAIR.

A year before the opening day of Chicago's 1933 World's Fair, thirteen buildings are either already standing, approaching completion or under construction and a number more will be undertaken this summer. Ten million dollars, assured by a bond issue underwritten by Chicago citizens is providing adequate advance financing. Contracts aggregating more than $3,000,000 have already been signed by more than 150 great corporations, representing practically every phase of industry, either for the purchase of exhibit space, or for the erection of special buildings. Forty-four states of the Union have either appropriated money for participation, or appointed official state commissions to develop exhibits. Four territories have made appropriations for exhibits. A bill authorizing an appropriation of $1,000,000 for a Federal building and exhibit has been passed by Congress and signed by President Hoover. Official acceptances to participate have been received from a number of foreign nations.

CANCER RESEARCH ENDOWMENT.

As a memorial to his son, Wm. Henry Donner of Villa Nova, has provided for the International Cancer Research Foundation, for which he has given an endowment of two million dollars. The income from the fund will be used in coöperation with other institutions in assisting qualified investigators. It is expected that the foundation will develop great possibilities in cancer research.

DRUGS AND COLORATION OF THE URINE.

The following colors in the urine are stated to be produced after ingestion of the medicaments named: Green to greenish black: bromoform, salol, pyrogallol, arbutin. Yellow to blood-red: antipyrin, acetanilid, analgen, sulphonal, trional. Blue to greenish blue: methylene blue. Brown to brownish black (in fresh urine or after standing): phenols, cresols, tannic acid, naphthalene, quinine. Rose-red: amidopyrin. Golden yellow (red with alkali): rhubarb, senna, cascara, frangula. Saffron-yellow and green by reflected light: santonin. Normal color but red with alkali: phenolphthalein.—H. Fischer (*Pharm. Ztg.*; through *Pharm. J. and Pharm*).

LARGE DOSES OF SODIUM SALICYLATE.

In acute and chronic cases of polyarthritis the administration of large doses of sodium salicylate, up to half an ounce a day with double the quantity of sodium bicarbonate, produced such satisfactory results, as compared with the usual small doses, that the introduction of this method into general practice is advised by Dr. K. Poller, writing in the *Deutsche medizinische Wochenschrift* (November 13, 1931, page 1936). Serious toxic symptoms, caused by salicylic acid could not be observed, and when discomfort or noises in the ears set in, one dose was omitted and the next one given after four hours' interval. The urine of all patients under treatment was regularly examined every day, and no harmful effects on the kidneys became evident. Salicylic acid appeared in the urine in all cases not later than 15 minutes after administration of the sodium salicylate (ferric chloride test). In the presence of sodium bicarbonate the elimination of salicylic acid in the urine was complete after forty-three hours; if given without the addition of sodium bicarbonate a slightly longer period was required—forty-seven hours—before the ferric chloride test becomes negative.

PERSONAL AND NEWS ITEMS.

James C. Munch was awarded a Medal of Honor of the Kiwanis International, by the Chester Pike Club, on June first, in recognition of his work in connection with the thallium out-break in California, early this year.

Dr. John C. Krantz, Jr., on May 2nd, delivered a radio address on "The Role of Chemistry in Health and Disease."

On May 16th he spoke before the American Therapeutic Society, held in Baltimore, on "The Utilization of the Carbohydrate in Burdock Root by Normal and Diabetic Individuals."

Francis P. Garvan was presented with the Mendel medal on June 7th in recognition of his contribution to scientific progress.

At the New Orleans meeting the House of Delegates of the American Medical Association elected Dr. Dean Lewis, professor of surgery at the Johns Hopkins University and surgeon-in-chief of the Johns Hopkins Hospital, to the office of president-elect. He succeeds Dr. Edward H. Cary, of Dallas, Texas.

The April number of the *Journal of Chemical Education* is an "Edgar Fahs Smith Memorial Number" and includes a symposium on "The History of Chemical Education in America." It contains a number of illustrations and copies of photographs of men prominent in the history of chemistry.

Dr. R. L. Swain, Deputy Food and Drug Commissioner of Maryland, has earned his degree in law, completing the course of the School of Law of the University of Maryland. He is the editor of the *Maryland Pharmacist,* also Chairman of the Conference of Pharmaceutical Law Enforcement Officials. It is interesting to note that the son also gained distinction and awards at his Alma Mater. He recently completed an interesting historical sketch of the founder of the school, paying due tribute to her in an illustrated booklet in which he evidenced his ability as a writer and skill in the art of the printer.

The American pharmacists tour, under the direction of Editor **Hugo Kantrowitz,** has been postponed until July 6th. Arrangements have been made so that members desiring to attend the meeting of the A. PH. A. at Toronto can return on the Aurania which sails direct to Montreal, arriving there about August 22nd.

Dr. George H. Needham has resigned his position as chief chemist for Hills Brothers Co., and engaged in consulting practice along microscopical and photomicrographical lines with laboratory located at Montclair, N. J.

The degree of Doctor of Pharmacy was awarded to **Lyman W. Griffin,** a graduate of the Massachusetts class of 1882. He has been a trustee and secretary of the corporation for more than twenty years.

Dr. Marston Taylor Bogert—professor of Organic Chemistry in Columbia University, the University's representative on the Board of Trustees of the pharmacy school—spoke at the Commencement Exercises on "A Layman Watches Pharmacy's Re-awakening."

Dr. Julius A. Koch and **Dr. James H. Beal** were guests of honor at the annual joint meeting of the Pittsburgh Branch of the A. PH. A. and the Pittsburgh College of Pharmacy Student Branch on May 12th. Addresses were made by the guests of honor, officers of both associations and Miss R. Corsello, Paul Geer, T. J. Casey, Jr. The addresses of the latter were, respectively, "A Girl Looks at Pharmacy," "Romance and Adventure in Pharmacy," and "Psychology in Pharmacy."

Blue and Gold Apothecary is the student publication of the University of California College of Pharmacy. The first issue is a most interesting number devoted chiefly to events at the school.

On May 24, 1932, at the Ninetieth Commencement of Howard College in Birmingham, Alabama, that institution conferred the degree of Doctor of Laws on **Dr. A. Richard Bliss, Jr.,** Dean of the School of Pharmacy of the University of Tennessee (Memphis). Dr. Bliss is an alumnus ('12) of Howard College.

Dean C. E. Mollett was honor-guest at a banquet, commemorating the 25th anniversary of his connection with Montana College of Pharmacy.

Dr. Emil Starz was voted an honorary degree of Doctor of Science by the University of Montana. He is a veteran Montana pharmacist, served on the Montana Board from 1895–1919, until elected chemist for the Montana Live Stock Sanitary Board. He is a bacteriologist and chemist and won distinction by his researches dealing with loco weed.

Prof. Leon C. Richards and Mrs. Richards are planning several automobile trips, including attendance at the Toronto meeting.

Former president of the British Pharmaceutical society, Herbert Skinner, now member of the Council and Chairman of the British Pharmaceutical Conference, will in October

next complete fifty years in pharmacy. In order to mark the event and in recognition of his many services to pharmacy, a dinner will be given him and other recognition for his many services to the calling.

Mr. Skinner was the first secretary of the North London Pharmaceutical Association and has held this office ever since that time. He is chief pharmacist at the Royal Northern Hospital in London.

Dr. E. D. Merrill, director-in-chief of the New York Botanical Garden, was elected an honorary member of the German Botanical Society at its fiftieth anniversary meeting in Berlin on May 18th. The two other American botanists who have received this honor are Dr. Asa Gray and Dr. Roland Thaxter.

Secretary E. F. Kelly of the A. PH. A. was guest speaker of Georgia Pharmaceutical Association, Atlanta, on May 17th. In his remarks he advocated closer coöperation between the state boards of health and the state pharmaceutical associations, to the end that the public may be given the best possible protection in buying drugs and cited the national laws relating to pharmacy. He also made reference to a number of recent surveys which show that the public prefers to buy its drugs from licensed pharmacists.

Secretary Kelly, also, was one of the speakers at the South Carolina Pharmaceutical Association meeting held in Columbia, June 15th and 16th.

Dr. A. R. Bliss was the guest speaker and addressed the alumni of Howard University at Birmingham. He traced the achievements of the institution and spoke of some of its graduates. He urged tolerance as an outstanding virtue of Howard's alumni.

The *Pacific Drug Review* has contributed a valuable service in presenting methods on prescription pricing.

Secretary Hayman of the West Virginia Pharmaceutical Association designates the coming joint meeting of Virginia and West Virginia Associations as "a whale of a meeting." Among the speakers are **Dr. James H. Beal**, Dr. Warren F. Draper, Health Commissioner of Virginia, **W. Bruce Philip, Harry S. Noel**, Dr. A. B. Brooks of Oglebay Institute, **Secretary H. C. Christensen**, of the National Association of Boards of Pharmacy.

Among the speakers at the North Carolina Pharmaceutical Association will be **W. Bruce Philip, Prof. Anton Hogstad, Jr., Dr. W. G. Crockett** and **Attorney E. C. Brockmeyer.**

Among the speakers of the Florida Pharmaceutical Association convention were: Dr. James H. Beal and President John W. Dargavel of the N. A. R. D. The meeting was held June 14th–16th at Orlando.

C. Jelleff Carr and Miss Agnes Mary McGrath were married on June 14th. Mr. Carr has won honors in chemistry, and is now holding the Francis P. Garvan scholarship of the American Chemical Foundation. He recently graduated in pharmacy from the University of Maryland and is now carrying out some special work for the U. S. P. Committee of Revision. A number of articles have appeard in the JOURNAL, most of them in coöperation with **Dr. John C. Krantz, Jr.**

W. Bruce Philip was the principal speaker at the 110th Commencement of the Philadelphia College of Pharmacy and Science.

The honorary degree of Master of Pharmacy was conferred on **John G. Roberts,** Philadelphia, **George A. Gorgas,** Harrisburg, and **John H. Webster,** Detroit.

FIFTY YEARS AGO.

Special guests of honor at the Philadelphia College of Pharmacy and Science at the Alumni reunions are the graduates who are celebrating the 50th anniversary of their graduation. A minstrel show was presented in their honor, because these alumni in their undergraduate days had been steady enthusiastic patrons of the minstrel shows. The show was recreated with some of the former Dumont's minstrels in the cast.

The graduates celebrating the semi-centennial this year were of the class of 1882. Among those present from this class were: Dr. Virgil Coblentz, Joseph M. Fronefield, Jr., Josiah K. Lilly, Dr. Alexander Macalister, William H. May, Dr. B. Franklin Scholl, Harry R. Stallman, Frederick W. E. Stedem, Judson Thomas, Dr. John A. Lambert and Dr. Herman E. Thoms, Indianapolis.

OPIUM MONOPOLY IN MANCHURIA.

The new state of Manchuria contemplates establishing an opium monopoly from which it expects to derive revenue amounting to twenty million yen, or more. The monopoly will be modeled after the system adopted by the Kwantung government. It has not been decided whether the state will control the planting of poppies.

OBITUARY.

JOHN THOMAS MOORE.

Dr. John Thomas Moore, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1888, died at his home in Lawrence, Kas., May 11th, aged 87 years. He was a charter member of Kansas Pharmaceutical Association and a former secretary.

Dr. Moore was a native of England, coming to the United States when 15 years of age. He was a graduate of Kansas University and of Washington Medical School, St. Louis. For several years he practiced medicine in Thayer, Kansas; in 1870, he engaged in the drug business at Lawrence.

Dr. Moore was one of Kansas' outstanding pharmacists and enjoyed the acquaintance and friendship of a large number of pharmacists and the high regard of educators with whom he came in contact. June 1880, he joined with a group in the formation of Kansas Pharmaceutical Association, in which he held life membership and devoted himself throughout his active life with unfailing interest. His records in the association as an officer are marked with neatness and care.

He suffered greatly during the last few years of his life, but this did not keep him from attending the annual sessions of the Association when at all possible.

Dr. Moore was an artist and some of his paintings are on exhibition in Lawrence art galleries.

Mrs. Moore and a daughter survive the deceased.

DAVID OLIPHANT HAYNES.

D. O. Haynes, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1887, died at his home in Garden City, L. I., aged 73 years. He was a native of Detroit and as a youth entered the employ of Parke, Davis & Co., advancing to the position of superintendent of manufacturing activities. In 1887 he established the *Pharmaceutical Era* and moved to New York City in 1894; four years later he purchased *The Commercial Shipping List* and made it a daily newspaper under the name of *New York Commercial*, which he disposed of in order to devote his entire time to his drug and chemical publications: *The Pharmaceutical Era, The Soda Fountain, Drug & Chemical Markets* (now *Chemical Markets and Drug Industry*). He issued (1896) *Depew's One Hundred Years of American Commerce.*

Mr. Haynes is survived by his widow, two daughters and three sons—William, Hasbrouck and D. O. Haynes, Jr.

VIRGIL COBLENTZ.

Last month it was our pleasure to present a half-tone of Dr. Virgil Coblentz as a frontispiece, together with a sketch of the distinguished pharmacist. Since then, we have been saddened by his sudden death in Philadelphia, where he had paid his respects to his *Alma Mater*. The deceased had been in poor health for several years and it was necessary for him to be accompanied by some one, fearful because of a heart trouble, that death might overtake him while away from home. He had gone into a restaurant near West Philadelphia station and fell dead soon after entering. He was accompanied by a friend, Joseph C. Richards, of New York.

A sketch of Dr. Coblentz will be found on page 425 of the May number of the JOURNAL, therefore this notice will be brief. He was *professor emeritus* of Chemistry at Columbia University and conducted a private laboratory.

He was joint author of Sadtler and Coblentz' "Medical and Pharmaceutical Chemistry" and of Coblentz "Hand-book of Pharmacy." Until in recent years he had been a frequent contributor to pharmaceutical and chemical literature.

His widow and two sons survive him.

HARRY LIONEL MEREDITH.

H. Lionel Meredith, member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1900, died at his home in Ft. Pierce, Fla., May 7th, after an illness of several months, aged fifty-eight years.

Mr. Meredith was born in Hagerstown, Md., and educated in the public schools of Washington County. He matriculated at the Philadelphia College of Pharmacy from which institution he graduated in 1900. Later he took up special work at the University of Pennsylvania in preparation for engaging in professional pharmacy and health work, under the Hagerstown Department of Health. Prior to this time Mr. Meredith was in partnership with Harry R. Rudy of Hagerstown, which partnership continued from 1900 to 1920.

For a number of years Mr. Meredith was a member of the Maryland Board of Pharmacy. In 1903 he was elected President of the Mary-

land Pharmaceutical Association, and, in 1924, President of the National Association of Boards of Pharmacy, presiding at the Des Moines meeting, at which time he delivered an address which received much favorable comment and marked him as one of the outstanding men in pharmacy. In 1925 Mr. Meredith moved to Florida where he resided until the time of his death. (For a more extended sketch see JOUR. A. PH. A., 13 (1924), 995).

He was associated with a number of fraternal organizations in which he took an active part, among them the Masonic bodies.

His widow, Mrs. Mary Maisch Meredith, is a daughter of the late Prof. John M. Maisch. Three children survive, H. Lionel, Jr., Austin, and Flora Marie Meredith, who is dean of the North Carolina State College for Women.

DR. FRANK L. SMITH.

We are just advised of the death of Dr. Frank L. Smith, 59, chemist for 41 years for Spurlock-Neal Co., who died February 11th, following an illness of several months. He had been a member of the A. PH. A. since 1910. He was born in Lewisburg, Ky. Survivors are his wife, Mrs. Lula May Smith; four children, Medora, Rosalyn, Lula May and Frank Halley Smith.

Announcement has been made of the death of G. S. V. Wills, veteran British teacher of pharmacy, at the age of 83. In 1874 he established the Westminster College of Pharmacy which has become one of the most successful British schools of pharmacy.

F. S. Newcomb, father of **Secretary E. L. Newcomb,** of the National Wholesale Druggists Association, died May 27th at his home in Campbell, Calif., aged eighty years. His widow and two sons survive. Secretary Newcomb air-planed to California to attend the funeral.

Theodore F. Hagenow, one of the most widely known retail pharmacists of Missouri, died at Barnes Hospital, St. Louis, May 22nd, aged 64 years. He was an alumnus of St. Louis College of Pharmacy, of which he was later president. He was a former president of Missouri Pharmaceutical Association and active in the N. A. R. D., of which he was a past-president. Mr. Hagenow is survived by his widow and son, Theodore.

Mrs. Nora H. Henry, Washington, widow of our late fellow member, Charles L. Henry, died June 4th, following a surgical operation. Mr. and Mrs. Henry took a deep interest in druggists' organizations and, after her husband's death, Mrs. Henry was a frequent attendant at these meetings.

SOCIETIES AND COLLEGES.

SECTIONS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The Section Officers solicit coöperation in the preparation of the program for the Toronto meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION. The names of the officers of the Sections are given below and members are requested to write as early as possible, giving the titles of the papers; the papers can be sent in later and should be accompanied by brief abstracts of them.

Scientific Section.—*Chairman,* L. E. Warren, Bureau of Chemistry, Washington, D. C.; *First Vice-Chairman,* W. J. Husa, U. of Fla., Gainesville, Fla.; *Second Vice-Chairman,* A. R. Bliss, Jr., Room 211P, 874 Union Ave., Memphis, Tenn.; *Secretary,* L. W. Rowe, % Parke, Davis & Co., Detroit, Mich.; *Delegate to the House of Delegates,* E. E. Swanson, % Eli Lilly & Co., Indianapolis, Ind.

Section on Education and Legislation.—*Chairman,* Rudolph H. Raabe, Ada, Ohio; *Vice-Chairman,* Charles W. Ballard, Mount Vernon, N. Y.; *Secretary,* Charles J. Clayton, Denver, Colo.; *Delegate to House of Delegates,* B. V. Christensen, Gainesville, Fla.

Section on Practical Pharmacy and Dispensing.—*Chairman,* W. G. Crockett, Medical College of Virginia, Richmond, Va.; *Vice-Chairman,* W. Paul Briggs, Washington, D. C.; *Secretary,* R. E. Terry, School of Pharmacy, University of Illinois, 701 S. Wood St., Chicago, Ill.; *Delegate to the House of Delegates,* I. A. Becker, Chicago, Ill.

Section on Commercial Interests.—*Chairman,* Rowland Jones, Gettysburg, S. Dak.; *Vice-Chairman,* Leon Monell, Buffalo, N. Y.; *Secretary,* John A. J. Funk, Galveston, Ind.; *Delegate to the House of Delegates,* J. G. Noh, Wichita, Kans.

Section on Historical Pharmacy.—*Chairman,* J. T. Lloyd, 300 Court St., Cincinnati, Ohio; *Secretary,* Louis Gershenfeld, Philadelphia, Pa.; *Delegate to the House of Delegates,* L. E. War-

ren, Bureau of Chemistry, Washington, D. C.; *Historian*, E. G. Eberle, 10 W. Chase St., Baltimore, Md.

Conference of Pharmaceutical Association Secretaries.—*President*, Charles J. Clayton, Denver, Colo.; *First Vice-President*, Walter D. Adams, Forney, Texas; *Second Vice-President*, J. W. Slocum, Indianola, Iowa; *Secretary-Treasurer*, Carl J. A. Harring, Newton Center, Mass. *Executive Committee:* P. J. Garvin, New Haven, Conn.; J. W. Slocum, Indianola, Ia.; Robert C. Wilson, Athens, Ga.; Rowland Jones, Gettysburg, S. Dak.; W. Bruce Philip, San Francisco, Calif.

Conference of Pharmaceutical Law Enforcement Officials.—*Chairman*, R. L. Swain, 2411 N. Charles St., Baltimore, Md.; *Secretary*, M. N. Ford, 608 High-Long Building, Columbus, Ohio.

Plant Science Seminar.—*Chairman*, E. B. Fischer, 4921 So. Fremont St., Minneapolis, Minn.; *Secretary-Treasurer*, O. P. M. Canis, Ozone Park, L. I., N. Y.

The Plant Science Seminar will meet in Toronto August 15th–19th, the Syllabus Committee August 19th–20th. For program of American Pharmaceutical Association see May JOURNAL, *page 513.*

SECTION ON EDUCATION AND LEGISLATION, A. PH. A.

The past few years have witnessed many changes in the education deemed necessary for the pharmaceutical professions as well as the enactment of important legislation relating to pharmacy in all its phases. A public expression of opinions on matters of educational and legislative interest, with the discussions resulting therefrom, is important as a guide for further action and the harmonizing of diverse views. The meetings of the Section on Education and Legislation provide opportunities for presenting your views and for a discussion of them by those equally interested and capable of offering intelligent comment. The fact that this is a joint meeting with the Canadian Pharmaceutical Association makes possible a wider interchange of ideas.

Research in pharmaceutical education by pharmaceutical educators was the basis of several papers at the Miami meeting and this work should be continued. Comments on new and modified courses to be offered in the four-year curriculum will be of value. Correlation of college teaching and board examination material would be helpful to both. The social aspect of pharmacy school courses is deserving of more attention. Reports upon legislative activities are always timely.

Your coöperation in the matter of presenting papers and joining in the discussions is earnestly sought. Titles for inclusion in the printed program should be accompanied by short abstracts (50–100 words) and should be received by the undersigned before July 1st.

C. W. BALLARD, *Acting Secretary.*
115 West 68th Street, New York, N. Y.

STATE ASSOCIATION MEETINGS.

Further reports will be made of state and national association meetings referring to a few of the outstanding features and the election of officers. To that end the JOURNAL will appreciate having reports of the various meetings for the files, also photographs and resolutions adopted. The announcement of the Colorado Pharmacal Association contains a great deal of informative matter and several pages relating to the work of the AMERICAN PHARMACEUTICAL ASSOCIATION. The cover is a beautiful design, blending the pharmaceutical with Colorado's scenery.

GOLDEN JUBILEE MEETING OF THE ALABAMA PHARMACEUTICAL ASSOCIATION.

The 50th anniversary meeting of the Alabama Pharmaceutical Association was held in Birmingham. Among the speakers on this occasion was President Walter D. Adams, A. PH. A.

The State conference for the organization of Alabama Pharmaceutical Association was called by Philip Charles Candidus of Mobile, the first honorary president of the A. PH. A. There were present, Charles Mohr of Mobile; G. C. Stollenwerck of Greensboro; L. T. Bradfield, Union Town; Hugo Plato, Culman; W. J. Hurd, Prattville.

The following officers were elected for the year 1881–1882: *President*, P. C. Candidus; *First Vice-President*, J. L. Davis; *Second Vice-President*, C. B. Stollenwerck, Greensboro; *Secretary*, S. W. Gillespie, Birmingham; and *Treasurer*, E. P. Galt, Selma. One of the first acts of the ASSOCIATION was to draw up a pharmacy law for submission to the state legislature. Since then the present "Model Pharmacy Bill" has become a law. The present *Secretary*, W. E. Bingham, has been a member of the ASSOCIATION since 1886.

The state of Alabama and city of Birming-

ham exhibited great interest in the fiftieth anniversary meeting.

ARKANSAS PHARMACEUTICAL ASSOCIATION.

The Arkansas Pharmaceutical Association held its fiftieth anniversary meeting in Hot Springs, June 14th–17th. President Walter D. Adams of the A. PH. A. was one of the speakers. The *Southern Pharmaceutical Journal* for June gives a résumé of Arkansas Association history. Further notice will be given in the next issue of the JOURNAL.

CALIFORNIA PHARMACEUTICAL ASSOCIATION.

The following were elected officers of California Pharmaceutical Association for the ensuing year: *President*, Harvey A. Henry, Los Angeles; *First Vice-President*, Mrs. Edna Gleason, Stockton; *Second Vice-President*, C. R. Brogan, Los Angeles; *Third Vice-President*, J. T. Scow, Berkeley; *Treasurer*, A. H. Vossmeyer, Los Angeles; *Executive Committee* (two-year term), J. C. Munn, Oakland; (four-year term), D. D. Wray, San Diego and C. P. Rose, Oakland; *Secretary* (reappointed), Roy A. Warnack, Los Angeles.

Fred C. Felter, of the *Pacific Drug Review*, spoke on prescription pricing; Carl Weeks spoke relative to the present state of things. President John Dargavel brought greetings of the N. A. R. D. and spoke of its activities. Among the things frequently discussed were that stronger support should be given to professional and trade organizations and that coöperation should prevail in business transactions. President Wray's message stressed the importance of activities and a résumé of the year's work.

OFFICERS OF DISTRICT OF COLUMBIA ASSOCIATION.

At a meeting of the District of Columbia Pharmaceutical Association, held at the Hotel Raleigh, April 13th, the following officers were elected: *President*, Paul Pearson (reëlected); *vice-presidents* representing the various sections of the district, Maurice G. Goldstein, northwest; August C. Taylor, northeast; G. W. Mathews, southwest; B. A. Smyser, southeast; *Executive Committee:* A. F. Gorsuch, T. A. Moskey, A. V. Burdine and F. B. Campbell.

A resolution was adopted opposing the proposed federal tax on cosmetics and soft drinks.

GEORGIA PHARMACEUTICAL ASSOCIATION.

Secretary E. F. Kelly, of the AMERICAN PHARMACEUTICAL ASSOCIATION, brought the greetings of that organization and made several addresses in which he emphasized the importance of pharmacy in the promotion of public health. He spoke of the surveys being promoted by the ASSOCIATION in determining the extent and character of pharmaceutical service.

Claude Rountree, of Thomasville, was elected president of the Association; other officers elected are: H. L. Chichester, of Macon, *First Vice-President;* William T. Knight, Jr., of Savannah, *Second Vice-President*, and M. D. Hodges, of Marietta, *Third Vice-President*. Dean R. C. Wilson, of the school of pharmacy, University of Georgia, was elected delegate to the AMERICAN PHARMACEUTICAL ASSOCIATION, and J. T. Selman, of Atlanta, was named delegate to the National Association of Retail Druggists.

Among the speakers were: W. L. Mitchell, of the U. S. Dept. of Commerce, Senator W. H. Duckworth and Governor Richard B. Russell, Jr.

Augusta was chosen for the 1933 convention.

ILLINOIS PHARMACEUTICAL ASSOCIATION.

The following were elected officers of Illinois Pharmaceutical Association for the ensuing year: *President*, T. B. Schaffer, Oneida; *Vice-President*, Arthur Van Hooser, Metropolis; *Second Vice-President*, George V. Haering, Chicago; *Third Vice-President*, H. N. Anderson, Monmouth; *Secretary*, Wm. B. Day, Chicago; *Treasurer*, G. M. Bennett, Urbana.

H. C. Christensen brought greetings of the AMERICAN PHARMACEUTICAL ASSOCIATION. President Leo L. Mrazek referred to the meeting being held in May, and as a feature of the convention, the giving of one day to the discussion of drug store problems and topics. Treasurer Bennett's report was reassuring and Secretary Day reported the addition of 138 new members. J. H. Riemenschneider presided over the sessions on practical topics; Samuel Shkolnik spoke on "Points of Business Law," and Victor Lawrence on "Building a Prescription Business."

The meetings were held in Peoria, opening on May 17th, closing with a banquet May 19th.

LOUISIANA PHARMACEUTICAL ASSOCIATION.

Louisiana Pharmaceutical Association celebrated its golden anniversary in New Orleans, May 16th–18th. The formation of the Association 50 years ago by Joseph T. Thibodaux and others, to meet the changing conditions of the early '80's in the drug business, was described by W. P. Duplantis, veteran member of the Association.

Proposals for a new pharmacy law for the state were made by William August Worner, of New Orleans, chairman of a committee which has considered this subject. President Paul Eckels, of Crowley, proposed changes in the organization of the state board of pharmacy in his annual address.

Secretary John E. Scott has been eminently successful in securing photographs of the past-presidents of the Louisiana Pharmaceutical Association and copies of them were distributed to the members. Wm. A. Worner, New Orleans, La., was presented with a loving cup for greatest service to pharmacists of Louisiana during the year.

Editor E. G. Eberle brought greetings of the AMERICAN PHARMACEUTICAL ASSOCIATION and delivered an address on the importance of pharmacy in public health matters.

The following officers were elected for the ensuing year: *President*, Wm. August Worner, New Orleans; *Vice-Presidents*, Morris Levy, New Orleans; Wm. Montgomery, Lafayette; C. R. Caldwell, Shreveport; John Collins, Monroe; Clarence E. Schaumberg, Covington; John P. Camel, Alexandria; *Treasurer*, Adam Wirth, New Orleans; *Corresponding Secretary*, George J. Feldner, New Orleans; *Reporting Secretary*, John E. Scott, New Orleans.

GOLDEN ANNIVERSARY MEETING OF THE MARYLAND PHARMACEUTICAL ASSOCIATION.

Maryland Pharmaceutical Association will hold its 50th anniversary meeting at Ocean City, Md., beginning June 21st. Special features of the convention will be an appreciation of Secretary E. F. Kelly's twenty-five years of distinguished and loyal services, and a reception to charter members and former presidents of the Association. Among the speakers of the convention will be President Walter D. Adams, A. PH. A., General Council, N. A. R. D., W. Bruce Philip; Dr. Robert Riley, Director of Health of Maryland, who will speak on "Pharmacists Relationship to Public Health." President Eldridge E. Wolff, of the Medical Chirugical Faculty, will speak on "The Modern Trend in Medicine." Dr. J. Ben Robinson, Dean of the University of Maryland School of Dentistry, has chosen for his subject, "Recent Developments in Dentistry." Dr. Frank M. Surface of the U. S. Department of Commerce, will speak on "The Significance of the St. Louis Drug Store Survey." Dr. John C. Krantz, Jr., on "A Half Century of Scientific Progress," and R. E. Lee Williamson has chosen for his subject, "How Can the Retail Pharmacist Use the Facts of the St. Louis Survey?"

Among the speakers at the North Carolina Pharmaceutical Association will be W. BRUCE PHILIP, PROF. ANTON HOGSTAD, JR., DR. W. G. CROCKETT and ATTORNEY E. C. BROCKMEYER.

The Missouri State Pharmaceutical Association met at Joplin, Mo., in its 54th annual session. Among the speakers were Roy Reese of the Kansas Pharmaceutical Association, Judge R. A. Pearson, Paul Mandabach, O. J. Cloughlin.

NEBRASKA PHARMACEUTICAL ASSOCIAT[illegible]

Nebraska Pharmaceutical Association held its 1932 meeting in Omaha, June 7th–8th. Considering President J. C. Thygeson's address and the recommendations of the Committee on his address a number of resolutions were adopted; among them, approval of First Aid, and Pharmacy Week, amendment of the pharmacy law, endorsement of the Capper-Kelly Bill.

President John W. Dargavel, of the N. A. R. D., brought the greetings of that body and spoke on some of the more important problems confronting the drug business. Attorney-General C. A. Sorensen spoke on "Fair Trade Practice."

The following officers were elected for the ensuing year: *President*, Bird S. Potter, Gothenburg; *Vice-Presidents*, E. E. Duryee, Oxford; C. S. Lincoln, Lincoln; Willard Dutton, Jr., McCook; Guy Butler, Lincoln; Henry G. Lee, Omaha; *Treasurer*, D. D. Adams, Nehawka; *Secretary*, J. G. McBride, Lincoln.

OKLAHOMA PHARMACEUTICAL ASSOCIATION.

The following officers were elected by Oklahoma Pharmaceutical Association: *President*, C. V. Newell, Oklahoma City; *First Vice-President*, Fred. Reed, Norman; *Second Vice-President*, Frank Foster, Norman; *Third Vice-President*, T. J. Dean, Okmulgee; *Secretary*, J. C. Shows, Oklahoma City; *Treasurer*, G. C. Cooper, Edmond.

President Walter D. Adams, A. PH. A., addressed the convention on the "Aims and Progress of the AMERICAN PHARMACEUTICAL ASSOCIATION," and Dean D. B. R. Johnson of the School of Pharmacy spoke on "The Relation of the Pharmacy to the Public." President C. V. Nichols gave a résumé of the year's activities of the Association; President J. W. Dargavel, of the N. A. R. D. in his address dwelt on the problems of the druggist.

TEXAS PHARMACEUTICAL ASSOCIATION.

The annual meeting of Texas Pharmaceutical Association was held at Austin, the State capital and the home of the state university and its Department of Pharmacy. Prof. William F. Gidley and his co-workers were kept busy during convention week in showing visitors about the new pharmacy building, seeing the various rooms and equipment. Many new buildings are going up on the university grounds, made possible by the forethought of the early citizens, in setting aside land for university and school purposes.

Houston pharmacists for Texas Pharmaceutical Association contributed another thousand dollars to the A. PH. A. Headquarters, which is to equip the editorial rooms and establish a fund for their maintenance. The retail pharmacists of Austin presented the editorial rooms of the Headquarters Building in Washington with an oil painting of Texas Blue Bonnets.

A daily paper, *The Morning Mortar and Pestle*, published by Margaret Cousins and Mildred Culbreath, informed the visiting members of the events of the day, and other interesting events.

Under the direction and management of Sam P. Harben the Drug Show was eminently successful. The AMERICAN PHARMACEUTICAL ASSOCIATION was represented by a display of architect's drawings of the Headquarters Building, interior and exterior, and a display of books and other literature. Chairman Anton Hogstad, Jr., gave an historical address relating to Cinchona and prepared an exhibit showing "Pharmacy Week" developments and possibilities.

One of the days of the convention was named "Adams Day," and brief talks were made by members and others, expressing friendship and appreciation for President Adams, of the A. PH. A. Among other gifts, he was presented with a platinum wrist watch. Mrs. Adams also was honored.

Thomas Roach, of the Executive Committee of the N. A. R. D. and *Chairman* of the House of Delegates, A. PH. A., was called upon on several occasions and his remarks were always well received.

E. G. Eberle brought greetings of the AMERICAN PHARMACEUTICAL ASSOCIATION and delivered an address in which he spoke of ASSOCIATION activities during the year of President Adams' administration.

Among other speakers at the convention were Dr. E. G. LeMay of the Food and Drug Division, of the State Health Department; J. M. Spoonts, the first pharmacist to be appointed to the State Board of Health; Gov. Ross S. Sterling, Mayor P. W. McFadden, Mrs. Ernest B. LeMay, Dean W. F. Gidley, Dr. Benjamin F. Eppright, President of the Travis County Medical Society, Hon. Paul Finn, Lee Tyler, Frank Yates, Mrs. Henry F. Hein, Dr. W. J. Danforth, John A. Weeks, Dr. Walter P. Shropshire, Lieutenant Governor Edgar Witt.

The Ladies Auxiliary opened its sessions with a Memorial Service for "Daddy" Graham. The regular meeting followed with Mrs. John B. Ray presiding. Mrs. W. Wentland was the Local Chairman. The Austin druggists tendered the visitors a barbecue, and President and Mrs. Oliver a reception and dance, including members of the Auxiliary and their husbands. Mrs. Henry F. Hein was elected president.

The Drug Travelers' Association celebrated its Silver Anniversary with a big meeting.

Interesting entertainments, a banquet, a dance and barbecue were part of the convention program. The pupils of the School for the Blind rendered a musical program and those of the School for the Deaf dancing and acrobatic numbers.

The following officers were elected for the ensuing year: *President*, L. C. Brenner, Gonzales; *First Vice-President*, Lee Stinson,

Snyder; *Second Vice-President*, E. H. Seely, Belton; *Secretary-Treasurer*, Walter D. Adams, Forney; *Home Secretary*, A. W. Griffith, Austin; *Historian*, C. A. Duncan, Dallas.

Members and Friends of the Scientific Section A. Ph. A.:

With the Toronto meeting now less than three months away the final round-up of titles of papers to be presented before the Scientific Section is under way. The response so far has been normal and satisfactory but many more are still to be heard from.

The closing date for acceptance of titles for the printed program is to be July 15th this year. Short abstracts must accompany the titles so that a complete set of abstracts can be made available for those attending the Convention. A copy of each paper should be in the secretary's hands prior to the opening session.

This is the final notice for the Toronto meeting of the Scientific Section, A. PH. A., which is to be held August 22 to 27, 1932, at the Royal York Hotel.

L. E. WARREN, *Chairman*, Scientific Section.

L. W. ROWE, *Secretary*, Scientific Section, c/o Parke, Davis & Co. Detroit, Michigan.

JAPAN PHARMACEUTICAL SOCIETY.

Abstracted from the *Japanese Retail Pharmacist*.

The 52nd general meeting of the Japan Pharmaceutical Society and the society's lecture meeting were held on April 16th and 17th, at the Imperial Academy Hall, Kanda, Tokyo. The meetings were attended by many representing pharmacy, horticulture and industrial chemistry. The following new officials were elected: *President*, Dr. Kintaro Ueno; *Vice-President*, Dr. Kotaro Nishizaki, former president of the Imperial Hygienic Laboratory of the Department of Home Affairs; *Secretaries*, Dr. Heihachiro Kondo (professor at the Tokyo Imperial University), Dr. Katsuzaemon Keimatsu (professor at the same university), Pharmacy-General Dr. Matajiro Watanabe; eleven councilors.

The following are some of the more important lectures delivered:

"On Hydnocarpus Oil and the Method of Manufacturing Fatty Acid Ethylester," by Ryuji Kobayashi of the Hygienic Research Laboratory of the Home Department.

This research has been undertaken at the request of the Lepra Prevention Society. The laboratory secured raw material from Siam and manufactured hydnocarpus oil on a large scale and a clinical study has been undertaken in various leper hospitals throughout the country.

"The Method of Manufacturing Ephedrine," by Messrs. Kozo Shinozaki and Shinji Tanaka.

Formerly, ephedrine has been manufactured by means of the Nagai-Kanao method. However, the importation of the German synthetic ephedrine has threatened the domestic industry as the German artificial product has been found to be as good as the natural product. Experiments have been made by means of such methods as Eberhard, Mans & Johnson, Skita & Keil, E. Spath and G. Koller. Messrs. Shinozaki and Tanaka have used the following two methods in their successful experiments: the electrolysis reduction of benzaldehyde and contact reduction.

EUROPEAN HISTORICAL SOCIETIES.

The Society for the History of Pharmacy has issued a second part on "Karl Wilhelm Scheele—His Life and His Work." A print has also been sent out to members of the Society showing the "Star Pharmacy" at Nuremberg, about the year 1710, also another picture showing Christ as apothecary, from an oil painting by Marie Appeli in the German International Museum at Nuremberg for the year 1731. The prints are suitable for framing.

The French Society for the History of Pharmacy has also continued its interesting work under the direction of M. E. H. Guitard. A number of early apothecaries have been briefly sketched and some of the bulletins have interesting illustrations. Both of these societies are rendering valuable service.

RESEARCH IN SUBSTITUTES FOR SANTONIN.

Research has been pushed on by Dr. Tatsuo Kariyone, head of the biology department of the Municipal Hygienic Laboratory of the Home Department, into substitutes for santonin which Japan has been importing from Soviet Russia to the amount of two million yen per year. Dr. Kariyone has been making a research into various medicinal herbs. Henopogium oil produced from the Japanese herbs could not meet the requirement of Japan Pharmacopœia, but experiments have been successfully made at the Herb Garden at Kasukabe for the purpose of raising herbs that can be turned into oil that will meet these requirements.

COMMENCEMENT EXERCISES.

The JOURNAL OF THE A. PH. A. is in receipt of invitations from many schools of pharmacy and desires to express appreciation and thanks for these favors.

UNIVERSITY OF MARYLAND.

The University of Maryland celebrated its 125th anniversary in the Ritchie Coliseum at College Park, all departments of the University being represented in the ceremonies. Governor Ritchie made the introductory remarks; Editor J. H. Finley of the *New York Times* was the principal speaker and Dr. Welch made a brief address.

The annual banquet of the Alumni Association of the Pharmacy School was held on June 2nd. The toastmaster of the evening was R. E. Lee Williamson. President R. A. Pearson and Honorary President of the Alumni Association, Charles Morgan, spoke briefly. President Carson P. Frailey of the National Drug Trade Conference and Secretary of the National Drug Manufacturers Association attended.

LEGAL AND LEGISLATIVE.

NARCOTIC DRUG LAW CONSTRUED.

The Washington Supreme Court: State *vs.* Helmer, decided that a statute made it unlawful to possess narcotic drugs unless such drugs had been lawfully obtained. The law also provided, in part, as follows:

In any prosecution for the violation of the provisions of this act it shall not be necessary for the indictment, complaint or information to set forth any negative allegation, nor for the plaintiff to prove that the defendant does not come within any of the exceptions herein contained; but such exceptions shall be considered as a matter of defense and the burden shall be upon the defendant to show that he comes within such exceptions.

In a prosecution for unlawful possession of a narcotic drug, the supreme court held that, while the state had the burden of proving beyond a reasonable doubt that the defendant possessed the drug, if the defendant desired to rest his defense upon his lawfully obtaining possession of the drug, he had the burden of proving such lawful acquisition to the extent of creating in the minds of the jury a reasonable doubt as to whether or not he had unlawfully acquired possession of the drug.

OREGON STATE FEDERATION OF PROFESSIONAL SOCIETIES.

Oregon State professional societies have affiliated in an effort to secure members of the Legislature, who in the opinion of the bodies will serve the best interests of the citizens. The societies associated for the purpose and concerned with medicine, pharmacy and more or less related service, are: Oregon Chapter, American Physiotherapy Association; Oregon State Dental Association; Oregon State Graduate Nurses Association; Oregon State Medical Society; Oregon State Pharmaceutical Association; Oregon State Veterinarians Association.

RHODE ISLAND PHARMACY LAW AMENDMENTS.

Pharmacy laws in general and pre-requisite requirements in particular were strengthened under the amendments recently passed by the Rhode Island Legislature and signed by Governor Case. The future registered pharmacist in Rhode Island must be 21 years of age, a citizen of the United States, of good moral character and temperate habits and a graduate from a four-year course in Pharmacy of not less than three thousand hours of instruction of which not less than twelve hundred hours shall have been devoted to lectures and recitations and not less than fifteen hundred hours shall have been devoted to laboratory work in a regularly incorporated educational institution authorized to confer degrees in the state in which it is located and which is approved by the Board of Pharmacy. Exemption is allowed to graduates of any college or school of Pharmacy or a department of Pharmacy of a university approved by the Board, who matriculated thereat prior to October 1931. Applicants must pass a satisfactory examination before the Board and shall also file proof satisfactory to the Board of four years of practical experience and pharmaceutical training under the supervision of a Registered Pharmacist. Actual attendance at college may be credited as pharmaceutical training not to exceed three years. Legislation was also included to allow reciprocal registration to Pharmacists of other states which previously had been allowed only by the rules and regulations adopted by the Board.

The amended law also abolishes the Regis-

tered Assistant Pharmacist classification except to those now holding such certificates and who did not graduate from a college after 1910 when the previous pre-requisite law was passed, and such future applicants actually engaged as clerks in licensed pharmacies on October 30, 1931, and who shall continue to be so engaged for at least three years thereafter and who, prior to October 30, 1936, shall have passed a satisfactory examination before the State Board of Pharmacy.

CHILE'S NEW SANITARY CODE.

According to the *Bulletin of the Pan American Union* the health and sanitary legislation has been modified. In the future only persons holding degrees from the University of Chile may practice medicine, surgery, dentistry, pharmacy, veterinary medicine, midwifery, nursing or any related profession.

Responsibility for the enforcement of the code is vested in a "director-general of public health," whose duty it is to formulate policies for municipal health regulations, to supervise revisions of the pharmacopœia, to direct inspection of buildings, to compile public health information, and to authorize establishment of private and public welfare services. Each province of the Republic constitutes a sanitary unit with a sanitary director assisted by a Public Health physician. Regulation of strictly local health matters is left to the municipalities. According to the code, the National public health service shall establish centers for vaccination, child welfare and prenuptial examinations. Free medical attention is provided for expectant mothers and for children of the native population. Private schools are required to retain the services of a physician. Strict measures concerning communicable diseases are included in the new law. Reporting of cases, isolation, fumigation and observation of contacts are obligatory. Children must be vaccinated against smallpox before they are one year old. Dispensaries for free treatment of venereal diseases are to be established and a special organization is to be created to fight tuberculosis.

ORDER TO CEASE USE OF PAID TESTIMONIALS OVERRULED BY COURT.

Declaring that the Federal Trade Commission was without authority to issue an order against the Northam Warren Corporation, manufacturers of "Cutex," directing the company to cease the practice of using paid testimonials in its advertising, the United States Circuit Court of Appeals for the Second Circuit has reversed the Commission's order against the company. The ruling is quoted from the *U. S. Daily:*

"In regard to the Commission's contention that the use of paid testimonials, without being so stated constitutes unfair competition, the court held that if the testimonials. . . . represent honest beliefs of the endorsers, there is no misrepresentation concerning the product, and no unfair competition is created. We have no right to presume that endorsers of commercial products falsify their statements because they have received compensation."

The Commission, according to the opinion of the court, found that the statements contained in the testimonials were truthful expressions of opinion of and concerning the products, but concluded that the failure to disclose the payment of compensation for the making of the testimonials "has the capacity and tendency to mislead and deceive the ultimate purchasers of said preparations into the erroneous belief that said testimonials are entirely voluntary and unbought, and tends to and does divert trade from competitors who do not use purchased testimony in advertising their products."

"The Circuit Court of Appeals in reversing the order of the Commission explained in its opinion written by Circuit Judge Manton, that the paid endorsement were said to be neither exaggerations nor untruthful, and that there was no claim of monopoly."

"While the testimonials," it is stated, "if having merit, may tend to increase the volume of business, still, if an honest opinion is expressed under the signature of the giver of such testimonial, the public cannot be presumed to be induced to purchase the petitioner's products in any way or manner that might be said to tend to divert trade from competitors who do not use testimonials in advertising their products. It is doubtful if the public is gullible enough to believe that such testimonials are given without compensation. But if they are paid for, providing they are truthful, no one is deceived."

The issuance of cease and desist orders on the basis of paid testimonials has not heretofore been questioned by the courts, it was stated orally at the Commission. It has not been determined, it was declared, whether the case will be carried to the Supreme Court of the United States.

BOOK NOTICES AND REVIEWS.

Applied Pharmacology. By A. J. CLARK. Published by P. Blakiston's Sons & Company, Philadelphia, 1932, x plus 590 pages. 4th Edition. 72 illustrations.

Foreign travel and study have definite value in scientific work in bringing changed views, other viewpoints and new visions of scientific possibilities. This book by Dr. Clark is as valuable a contact as a trip to Europe at the present time in evaluating continental opinions and developments in pharmacology. The American reader is struck by several differences in the concise and readable presentation of an enormous amount of useful and pertinent information. The general history of therapeutics and the necessity for biological standardization of drugs given in the introduction is followed by two chapters on the action and use of disinfectants, followed in turn by three chapters dealing with "Specific Therapeutics." A discussion of anthelmintics is then connected in a logical fashion. The next six chapters deal with the action of drugs upon the central and autonomic nervous system, and with local anæsthetics. A thoroughly scientific discussion is given of the therapeusis of alcohol. It is regretted that a more adequate discussion of the higher members of the ethyl alcohol series was not presented. A very understandable presentation of the action of the sympathetic and parasympathetic nerves upon the chief organs of the body is a feature of one chapter.

Three chapters are then devoted to the pharmacology and physiology of the alimentary canal; emetics, sea-sickness, periodic activity, function of acids and alkalies, hyper- and hypo-chlorhydria, the gall bladder, intestinal activities, the effect of various types of purgatives, the action of astringents and opium and the treatment of diarrhea are all briefly discussed in about sixty pages.

The pharmacology of the heart and blood vessels is next presented, with suggestions regarding the differences in activity of glucosides of the digitalis group, and the nature of their action in various heart involvements as studied electrocardiographically. Succeeding chapters are devoted to the pharmacology of respiration, kidneys, liver, temperature regulation, the skin, endocrine glands, vitamins and inorganic metabolism. The last two chapters deal with the pharmacological action of X-rays and radium emanations, and with various immunity reactions. This last chapter also touches on the production and activity of various vaccines and antitoxins, gives a brief discussion of non-specific vaccine therapy and touches on the mechanism of "Vaso-Motor Reactions" (a term suggested as a substitute for the term "anaphylactoid reaction").

The subject matter is presented to coördinate results obtained in experimental pharmacology in the laboratory with therapeutic observations in the clinic; a discussion of physiology and pathology connects the work in these fields. Modern work on the rôle of vitamin A in maintaining resistance against infection, and of the importance of the anterior pituitary gland in its action on growth and reproduction is presented. A rather unusual feature is the inclusion of the wholesale prices for various drugs and preparations which permits evaluation of relative costs.

It seems somewhat unfortunate that the rather limited bibliography following each chapter is devoted largely to work by European investigations and that, apparently, studies in the United States have not received a due share of attention. However, the references to general literature give an opportunity for further search by interested students and readers. The ever-growing literature of this field necessitates somewhat arbitrary selection of a bibliography for any current text and Dr. Clark has presented those references which gave recent general reviews of the subjection under discussion.

The student of quantitative pharmacology is somewhat disappointed in not finding methods of physiological standardization discussed or pointed out in detail. One feels a particular loss in not finding a discussion of the standardization of ergot upon the rabbit uterus, a method which was developed by Dr. Clark. It is hoped that a subsequent edition will touch on the quantitative phase of pharmacology to round out the very excellent presentation of qualitative pharmacology on normal and pathological men and animals.

The book is well edited, well printed and well bound. The detailed data given in 50 tables are clearly presented for quick reference. Very few typographic mistakes were found, which is a triumph in the publication of so technical a book.—JAMES C. MUNCH.

The Cost of Medicines. The Manufacture and Distribution of Drugs and Medicines in the United States and the Service of Pharmacy in

Medical Care. By C. RUFUS ROREM, Ph.D., C.P.A. and ROBERT P. FISCHELIS, B.S., Phar. D. The University of Chicago Press—Publication Number 14, The Committee on the Costs of Medical Care.

The major title of the book appears unfortunate. Much of the information included has but little relation to the cost of medicines. In addition, this title does not do credit to the comprehensive work of the authors nor to the value of the publication.

The book has three parts: Pharmacy and Medical Care; Pharmacy and the Drug Industry; Pharmacy and the Public. An idea of the scope may be gained from the chapter headings; (1) Medicine and Medical Care; (2) The Nation's Bill for Medicines; (3) The Profession of Pharmacy; (4) The Pharmacy, Its Business in Medicines; (5) The Pharmacy, Its Financial Organization and Operation; (6) Other Retail Distributors and Dispensers of Medicines; (7) Manufacture of Medicines; (8) Wholesale Distributors of Medicines; (9) The Advertising of Medicines; (10) Advertising and Promotion of Quack Medicines; (11) Public Control of Medicines and Pharmacy; (12) Medicines and the Medical Professions —Chapter 13 is devoted to Summary and Conclusions and closes with the author's four recommendations.

The Committee on the Costs of Medical Care has spent almost five years of work and nearly a million dollars and has collected a vast amount of information which was available to the authors. However, much of the data is based on studies of more or less limited scope, when the whole country is considered, and must be so accepted.

Drs. Rorem and Fischelis, with the unusual facilities at their disposal, have made a valuable contribution to the work of the Committee on the Costs of Medical Care and to pharmaceutical literature. The book presents probably the most comprehensive and complete study of pharmacy in all of its branches, that has been made. It pictures in broad terms, the scope of pharmaceutical service, and demonstrates conclusively that pharmacy's part in medical care is a very important one, viewed as a necessary service or from the standpoint of cost. The treatment is frank, and agreement with the statements, conclusions and recommendations is not necessary to an appreciation of the evident work and study the authors have given to the publication.

It is in good form, well printed and commendably free from errors. There is considerable repetition, possibly unavoidable, and in places a positiveness which the information referred to would not seem to justify. A note of pessimism about the value and the future of pharmacy runs through the text, which the long history of the profession and its present status does not warrant. A more sympathetic attitude toward the difficulties within pharmacy which are clearly set out, might have brought better results.

It must be evident to any one who reads this book carefully that the people show more deliberate judgment in securing and using drugs and medicines than the members of the medical professions usually credit them with, and that all drugs and medicines must be considered as within the scope of pharmaceutical service, whether taken with medical advice or not.

The opening sentence, "The use of medicines in the care of the sick is the oldest practice of the healing art" and the later statement that the public pays about as much for drugs and medicines as it does to physicians or to hospitals, indicate that drugs and medicines have not lost their appeal or their value during the years. It is stated that the words "medicines" and "drugs" are used interchangeably to include all chemical, pharmaceutical and biological preparations used in medical care, and that mechanical appliances are excluded. The definition given in the Pure Food and Drugs Act is more comprehensive and it is difficult to understand why it was not used; if so, a much better basis would have been established.

The authors classify drugs and medicines as prescriptions, home remedies and patent medicines. Of the total estimated annual expenditure of $715,000,000, $190,000,000 or 27 per cent is for prescriptions, $165,000,000 or 23 per cent for home remedies and $360-000,000 or 50 per cent for patent medicines. About 10 per cent of the drugs and medicines may be classed as "quack remedies."

The quality and purity of drugs and medicines appears to be satisfactorily controlled. The main criticism is that the claims for many of them are exaggerated and that the preparation of home remedies and patent medicines in large quantities is not as well regulated as is that of prescriptions.

Drugs and medicines are distributed through four channels; pharmacies or drug stores, other retail stores, physicians and hospitals.

General stores distribute about $40,000,000 or 6%, physicians about $25,000,000 or 3½%, hospitals $25,000,000 or 3½% and pharmacies $625,000,000 or 87%. As many of the hospitals employ pharmacists it may be estimated that 90% of all drugs and medicines are distributed under pharmaceutical supervision.

It is stated that "The pharmacy" or "drug store" dominates the sale and distribution of medicines in the United States; more than 87 per cent of all drugs and medicines are sold through drug stores. The supremacy of the drug store extends to all the different types of medicines shown in Table 1—"Meaning prescriptions, home remedies and patent medicines."

On the other hand, it is stated that about 70 per cent of all drugs and medicines are obtained and used without medical advice, which includes patent medicines and most of the home remedies. These latter classes are purchased to perform essentially the same functions as the medical professions and institutions.

Another very interesting observation is that "there has been no general complaint against the prices of drugs and medicines."

It would appear, then, from this information that the American people still spend on drugs and medicines for self medication about 60% of the amount they pay to physicians or to hospitals, and that they look to the pharmacy to supply them with above 87% of all the drugs and medicines they use.

In the discussions of the profession and industry that renders this pharmaceutical service, much interesting and valuable information is provided.

In education and training and through the adoption of a strict code of ethics, the pharmacist is well prepared for his part in supplying adequate medical care. In a large measure he dominates the distribution of drugs and medicines but he is not given complete control of the job since the preparation of drugs and medicines, other than prescriptions, can be carried on by persons with no pharmaceutical training or responsibility. In other words, a million pills can be made by any one, whereas a prescription for a dozen pills must be filled only by a licensed pharmacist whose competency has been determined by a state examining board. The conditions under which drugs and medicines are prepared, dispensed and distributed in many hospitals and institutions is not properly controlled.

The educational institutions and the machinery for examining and licensing pharmacists are found to be reasonably satisfactory.

The laws regulating the practice of pharmacy for the protection of the public are inadequate and, as stated above, they are not applicable equally to those who engage in small and large operations. It does not seem reasonable to consider drugs and medicines as warranting control, from the public welfare standpoint, in small quantities and not in large quantities. The machinery for enforcing the laws regulating the practice of pharmacy is very inadequate and the public interest requires that this serious omission be remedied.

The number of licensed pharmacists, about 115,000, is fully adequate for all branches of pharmacy and the number being graduated and registered annually, about 2700, does not seem to be excessive, considering the population to be served, if the whole job, so far as safety is concerned, were put under the control of licensed persons only.

The number of pharmacies is not excessive if they could be more evenly distributed. Even if so distributed, there is not sufficient pharmaceutical service required to adequately support them. So they have to engage in other activities, more or less related, or be seriously reduced in number with the result that pharmaceutical service would not be available to the people, especially in less populated areas.

Pharmacy is considered to be a profession but because all of the pharmacist's attention is not given to the practice of it, pharmacy is practiced as a "part time profession," in most pharmacies. This condition is magnified in most states by the provision that pharmacies may be owned and operated by others than pharmacists, provided a licensed pharmacist is employed to fill prescriptions and to sell poisons and narcotics. In these establishments, particularly the chain stores, drugs and medicines are merchandise to be disposed of.

In keeping with the machine age and with the tendency to combinations and control by capital, a large industry in the wholesaling, manufacturing and advertising of drugs and medicines has grown up and is largely without pharmaceutical advice or control. The industry is directed, in a large measure, by those to whom drugs and medicines are commodities to be sold and to pay dividends. The extensive and intensive advertising of drugs and medicines in order to pay profits and not necessarily to benefit the public, has introduced a very disturbing factor in pharma-

ceutical service and should be more carefully regulated by law. "The growth of 'patent medicine' sales illustrates not so much improvement in the quality of medicine as improvement in advertising technique." Public control has been directed more toward the purity and quality of drugs and medicines than toward their therapeutic value. It is incongruous that the members of the medical professions should be controlled by strict laws and rigid codes of ethics while the manufacturer of drugs and medicines should be free to use the methods of ordinary business enterprise, and to freely distribute secret remedies.

It is felt that self-medication by the people should be limited to the treatment of simple and minor conditions, understood by patient and pharmacist, with non-secret remedies and that the laws regulating the manufacture and distribution of drugs and medicines, both federal and state, are inadequate. The most effective control now is through the educational activities of medicine, pharmacy and dentistry with the public. The importance of drugs and medicines in relation to public health would seem to warrant complete and not partial regulation of them in the interest of the public welfare.

The annual expense for medicines is too large. It might be reduced by $300,000,000, assuming that the costs of prescriptions and home remedies cannot be materially reduced; and that only about 20 per cent of the secret-formula products are actually useful in medical care. The present system of the manufacture and distribution of secret-formula preparations can be justified only on the assumption that the public is qualified to diagnose its diseases and to select suitable remedies.

The authors submit four recommendations. In brief they are: (1) that there should be more adequate use of the professional knowledge and skill of the pharmacist; (2) that selected lists of home remedies, prepared by a committee of physicians and pharmacists, should be distributed by agencies established for the purpose and that self-medication be rigorously discouraged; (3) formula disclosure of the kind and quantity of medicinal ingredients; (4) federal licensing of all the manufacturers of drugs and medicines based upon satisfactory conditions as to personnel, equipment, sanitation and standardization of products. Although some of these recommendations are in keeping with the thoughts of many who have studied the situation, they do not, as a whole, seem to cover all of the requirements the authors have indicated as desirable and necessary. Possibly it was felt that their adoption or even partial adoption, would mark a long step in pharmaceutical advancement.

The public have so far reserved the right to purchase and use drugs and medicines, as a part of their medical care, without the advice of physicians or the services of hospitals and clinics. This applies, in increasing proportion, to prescriptions, through refilling, to home remedies and to patent medicines. That the public continues to exercise this right and that the exercise of it constitutes a very important phase of medical care is apparent. Until, through education or some other process, the public decides to adopt a different attitude to drugs and medicines, it is the manifest duty of pharmacy to prepare and distribute them and to see as far as possible that the people are not imposed upon.

The authors of "The Cost of Medicines" are to be commended for so frankly and fully discussing the situation as they see it and for raising questions which relate as much to public policy and to the other public health groups as to pharmacy.—E. F. K.

The Structure and Composition of Foods. By Andrew L. Winton, Ph.D., and Kate Barber Winton, Ph.D. Volume I. Cereals, Starch, Oil Seeds, Nuts, Oils, Forage Plants. 710 pages, with 274 illustrations by the authors. John Wiley & Sons, Inc., New York, 1932.

In view of A. L. Winton's earlier contributions to the scientific literature on foods, the appearance of Volume I of the above titled work has been awaited eagerly ever since the announcement of its preparation. Now that the book has been published it is at once evident that the authors have produced a valuable treatise and that it is no mere revision of a few sections of earlier publications enlarged by the mechanical interleaving of data compiled from the literature in the interim. We are dealing rather with a perfected work of scholarship.

Among the questions which the reviewer likes to answer first about a new book are those of scope and content. Or, to phrase it humanly, what did the author try to cover, what did he actually put into his book? They may be answered in this instance by quotation:

> "Appreciating the lack of a comprehensive work in the English language, comparable with, yet differing from, the

voluminous works in German and French, the writers' task has been partly to collect, select, summarize, and unify, so far as expedient, results on the composition of a great variety of products scattered through numerous journals, and partly to add their own contributions, largely hitherto unpublished, on the gross and microscopic structure of these products."

"Special stress is laid on the relation of structure to chemical composition, which is analogous to that of animal anatomy to physiology, one being incomplete without the other."

"The products described—cover a broad geographical range—oriental and occidental, temperate and tropical. Analytical methods and vitamins, adequately treated elsewhere, are not included."

"No emphasis is placed on the application of the subject matter in any one particular field; it is presented as general information for any who may have need."

The authors also have stated succinctly the pattern by which they organized their material:

"The plan followed in this and succeeding volumes is quite simple. The classification is *first* by economic groups as shown on the covers and title pages, *second* by parts—fruits, seeds, leaves, etc., *third* by families, *fourth* by genera, and *fifth* by species.—After brief statements of origin, habitat, botanical relationships, and uses, the scientific subject matter is treated under three main heads: (1) macroscopic structure, with due regard to morphology; (2) microscopic structure, which is equivalent in most cases to histology or morphology of tissues; and (3) chemical composition of the natural product and when practicable, its parts separated mechanically whether in the laboratory or in the factory."

A further guiding principle was expressed in the words: "Too great emphasis cannot be laid on the importance of studying each morphological part by itself whenever it is possible to effect a separation. An investigation carried out, for example, on a mixture of starchy endosperm and oily embryo is as unscientific as an analysis of a mixture of a mineral crystal and its matrix."

These precepts have been well adhered to, consequently the volume is a well-organized compendium of a vast amount of specific information hitherto largely scattered. More restricted in scope than Wehmer's Die Pflanzenstoffe, the presentation is less condensed, hence more readable. The illustrations, all originals by the authors, are a monumental contribution to the subject and visualize for the lay reader the otherwise unintelligible descriptions of morphology and histology. In fact they constitute the outstanding feature of the book. Another valuable characteristic is the extensive documentation by footnote references to original sources which, like the introductory acknowledgments, shows that the authors have indeed covered "a broad geographic range."

While this treatise will appeal primarily to workers concerned with nutritional or industrial food problems, the pharmacist will also find much interesting and useful information, there being no real demarcation between foods and materia medica. This book would be valuable as a means of enlarging the general education of any pharmacist. Then, there is much information which should prove professionally important, for instance, the recent data on the occurrence of the minor ash constituents of foods, iron, copper, manganese, zinc, boron and others. The illustrations are an excellent supplement to texts on pharmacognosy. Of technical interest, too, are the sections dealing with the purified starches, the various fatty oils, the seeds of the mustard and rose families, of hemp, flax, poppy, etc. Even some poisonous plants, because of their association with foodstuffs, are discussed. In short, the reviewer heartily recommends this book to the pharmaceutical profession.—ROLAND E. KREMERS.

"Prescription Department Sales Analysis in Selected Drug Stores."—Domestic Commerce Series No. 61, Department of Commerce, Bureau of Foreign and Domestic Commerce, April 1932, pages 37. By FRANK A. DELGADO and ARTHUR A. KIMBALL. This is the first of a series of three publications to be released concerning the professional phase of the National Drug Store Survey, which has been conducted in St. Louis for the past year by the United States Department of Commerce in coöperation with 33 professional and trade associations of the drug industry. This report should be of value to all branches of the pharmaceutical profession and industry in solving some of the problems confronting them at this time.

The prescription departments of 13 retail

drug stores in St. Louis, including 11 independent stores and 2 chain store units, were the test laboratories. Both the professional and merchandising aspects of these prescription departments are carefully analyzed in this report. The study shows that the prescription department occupies an important place in drug store activities, comprising an average of nearly one-fifth of the sales in the 11 independent drug stores when considering both prescription business and non-prescription sales from the prescription department. Opportunities for increasing prescription department volume, without conflicting with the prerogatives of physicians, the ethics and the standards of the profession in any way, are pointed out in this report.

Among the subjects treated in this publication are the following: Share of prescription department in total sales volume, non-prescription sales from the prescription department, daily and annual prescription business by types, new and refill prescription business in 11 stores for six months, trend of sales from 1930 to 1931, seasonal demand for prescriptions, opportunities for sales increase; prescription department share in inventory; prescription price trends; high-priced prescriptions; form of prescriptions by type and by individual stores; liquid prescription sizes; skill required in prescription compounding; indication of size of capsule used; use of metric system for prescriptions; analysis of prescription business of eight stores, by physicians; legibility of prescriptions; extent of specification by physicians of galenicals of particular manufactures; extent of counter prescribing by druggists and dispensing by physicians; study of prescription ingredients; number of ingredients used; frequency of occurrence of ingredients; model prescription department; and list of leading ingredients.

The list of leading ingredients printed in this publication should be of particular value to manufacturers and wholesalers, as well as pharmacists and students, as a basic stock around which to mold the prescription department inventory. Practically all of the chemicals and galenicals were official, that is, listed in the United States Pharmacopœia or National Formulary. Frequent mention of these two standard works is made throughout the report.

"Prescription Department Sales Analysis in Selected Drug Stores" is obtainable from the Superintendent of Documents, Washington, D. C., priced at five cents a copy. The first printing is exhausted, but the second printing is now being made. Quantity discount was allowed on the first printing and it is possible that this may also be obtained on the second printing.

National Directory of Commodity Specifications.—The U. S. Department of Commerce issues a number of publications in the interest of all divisions of trades and professions. Service is always in evidence and studious care is exercised in selecting and compiling the information. Attention has been heretofore directed to publications that are sources of information for the drug-trade activities and pharmacy. Recently "National Directory of Commodity Specifications" has been revised and brought up-to-date. The AMERICAN PHARMACEUTICAL ASSOCIATION is liberally quoted, most frequently in connection with standards for drugs, chemicals and preparations of them. The "National Formulary" is recognized as a standard and the "Pharmaceutical Recipe Book" is mentioned in connection with unofficial preparations but not recognized as a standard in the enforcement in the Federal Food and Drugs Act. The Directory is a valuable source of information for dealers and manufacturers regarding standards of all products and a reference to associations and other organizations engaged in work of the kind indicated.

TRANSPORTATION TO TORONTO MEETING.

Secretary E. F. Kelly and Secretary R. B. J. Stanbury are now preparing to send certificates to the members with further information about the meeting. These certificates will entitle members to buy excursion tickets at one and one-half fares for the round trip for themselves and members of their families, excepting from stations near Toronto, with low fares.

The tickets will be sold from August 12th to August 23rd on presentation of the identification certificates and will be good for return to the starting point for thirty days from the date of sale. Also, different routes for the going and returning journeys will be allowed. This will be the first time that this privilege of diverse routes on reduced fares has been allowed to meetings of our ASSOCIATION. The dates for the sale of tickets are arranged to cover the meetings of related organizations during the week preceding the convention.

PLANT SCIENCE SEMINAR.

PHARMACOGNOSY, PLANT CHEMISTRY, BOTANY AND AFFILIATED SCIENCES.

Secretary-Treasurer O. P. M.-Canis has issued the following announcement:

"No doubt you have been wondering at the delayed announcement concerning the Plant Science Seminar this year—but our committee has not by any means been delinquent in their duties. Owing to the fact that we have no active Canadian members, several trips to Canada had to be made, followed in turn by considerable correspondence between the committee members, which accounts for the delay; however, we are now pleased to report: all's well and well under way.

"Dean Heebner of the Toronto College of Pharmacy and Prof. Thomsom, head of the Botany Department of the University and his staff have not only graciously offered us the use of the Botany Department, including any desired demonstration material, but have also kindly assured us of their valuable assistance and coöperation. Accordingly, please note:

THE 10TH ANNIVERSARY SESSION OF THE PLANT SCIENCE SEMINAR WILL TAKE PLACE

Monday, August 15th until and including Friday, August 19, 1932, at the Toronto College of Pharmacy, Toronto, Ontario-Canada.

"The 'housing question' has also been most favorably settled by the generous offer of one of the University dormitories for the use of our members, ladies and guests. Price: $1.25 per day per person, with a minimum charge of $5.00 per person. Meals can be had at reasonable prices at the cafeteria or in nearby restaurants.

We are about formulating an official program to be mailed within the near future. If you contemplate presenting a paper, kindly submit titles to the Secretary at once together with any other suggestion you may wish to make.

Two very fine botanizing trips have so far been provided for, as well as a trip around the Toronto harbor and around the city of Toronto; and as a special entertainment feature for our members, ladies and guests, we are very happy to announce that we have succeeded in making arrangements with the well-known international moving picture concern—the D. A. R. BAKER *Moving Pictures, Pizberg-Hollywood*, who have agreed to present for the first time their latest, startling sound-proof feature: "The Plant Science Seminar at Work and at Play," under the personal supervision of their enterprising director, D. A. R. Baker, who has made extensive travels in all parts of the world, collecting data and scenes. *Well worth seeing!*

Please do not delay making your reservations for room, with the Secretary, and mail us title of your paper at your very earliest convenience.

E. B. FISCHER, *Chairman*
A. B. LEMON, *Local Chairman*.
O. P. M.-CANIS, *Secretary-Treasurer*.

NATIONAL CONFERENCE ON PHARMACEUTICAL RESEARCH, TORONTO, ONTARIO, AUGUST 20TH.

L. E. Warren has advised us of the rates applying to Toronto for the National Conference on Pharmaceutical Research which convenes August 20th. Members should refer also to the preliminary report from the A. PH. A. Transportation Committee, Theodore J. Bradley, Chairman, on page 313 of the April issue.

The following announcement has been made by the Canadian National Railroads, Grand Trunk Railway System, through the District Passenger Agent in Washington.

The circular letter quotes the announcement made in the April JOURNAL; it reads:

Account of the above, there will be on sale from August 12th to 23rd special rate of fare and one-half for the round trip, limited returning for thirty days. As an example, the round trip fare from Washington is $29.07; parlor car fare and lower berth in each direction, $5.63.

On Sunday, August 21st, we will operate special service for your members as follows:

Lv. Washington—4:00 P.M. B. & O.-Air-Cooled, Sunday, August 21st, Special Parlor Car.

Ar. Wayne Junction—6:55 P.M. At B. & O.-Air-Cooled, Sunday, August 21st, Special Parlor Car.

Lv. Wayne Junction—6:57 P.M. At Rdg., Sunday, August 21st, Special Sleeper.

Ar. Toronto—7:55 A.M. C.N.R., Monday, August 22nd, Special Sleeper at same platform, same station.

Special service same as above will be operated on August 19th for the National Conference on Pharmaceutical Research.

Similar service southbound after Convention.

We are also arranging a special post-convention tour for those desiring to see more of Canada, taking in the Thousand Islands, Montreal, Quebec, Lake Champlain, Lake

George and New York. The service shown on the attached itinerary is flexible and may be lengthened or shortened as desired. Tickets are limited returning until October 31st. Hotels and meals extra. Consult your local Ticket Agent or this office for reservations and transportation.

Signed by the District Passenger Agent at Washington, D. C.

TORONTO HOTEL ACCOMMODATION.

For Hotel Rates see page 314, April JOURNAL.—Make Hotel Reservations Direct. In case of difficulty in securing accommodation write to N. B. Strong, Chairman, Hotels Committee, King Edward Hotel or F. R. Rutherford, Vice-Chairman, Hotels Committee, Royal York Hotel.

GARAGE ACCOMMODATION.

Convenient to Convention Headquarters (The Royal York) and other hotels.

Petrie's Parking Place, 131 Front Street West; York Garage, 126 Adelaide Street West; Bay-Front Garage, Ltd., 159 Bay Street; St. James Garage, Corner Church & Lombard Sts.; Bay Adelaide Garage, 65 Adelaide Street West; Commonwealth Garage, Corner Victoria & Colborne.

Provided, delegates make arrangements personally with garages on arrival, the following rates have been arranged: 60¢ per day from 8 A.M. to 12 P.M.; $1.00 over night or 24 hours; $3.00 for 4 days' parking.

DELAWARE PHARMACEUTICAL ASSOCIATION MEETING.

The Delaware Pharmaceutical Association will hold its annual meeting June 28th and 29th, at Rehoboth Beach, Henlopen Hotel.

SOUTH CAROLINA MEETING.

Secretary E. F. Kelly was one of the principal speakers at the South Carolina meeting held in Columbia, June 15th and 16th. The main points of his remarks centered on the importance of pharmacy as a public health activity. He also spoke of coöperation with Government departments in various activities promoted by the AMERICAN PHARMACEUTICAL ASSOCIATION.

MARYLAND PHARMACEUTICAL ASSOCIATION.

The Maryland Pharmaceutical Association held its annual meeting in Ocean City, June 21st to 24th. The members celebrated the golden anniversary and the silver anniversary year of Secretary E. F. Kelly. The program was arranged accordingly, and a silver service was presented to the latter in recognition of his services and as an expression of the appreciation and esteem of the membership; the Drug Travelers' Association evidenced the regard of its members by the gift of a beautiful silver electric clock. Further comment will be made in a succeeding number of the JOURNAL.

CANADIAN NATIONAL EXHIBITION ASSOCIATION.

The Canadian National Exhibition will, on request, mail you an interesting illustrated folder. The address is the Lumsden Building, Toronto 2, Canada.

TAXES WILL NOT BE ABSORBED BY PRODUCERS.

Quoting the *Oil, Paint and Drug Reporter* of June 20th, "To the extent that manufacturers and importers have made known their position, it is apparent that the excise taxes imposed by the new revenue act will be passed on to distributors. Wholesalers will pass the taxes on to their retail customers. What the latter will do it is not possible to foretell.

"Several conferences of manufacturers and distributors have been held during the past week for discussions of tax problems. In the cosmetics trade, there was some doubt, later in the week, whether the tax would eventually be absorbed by the manufacturers and importers; but, the general belief was that the tax would be passed on. All manufacturers who disclosed that they had reached a decision in the matter intended to increase their prices to cover the addition of the tax. The method of billing the tax separately, without increasing the list price of the taxed article, is purposed in some instances. Some manufacturers of so-called 'treatments' will absorb half the tax and require their representatives to absorb the remainder.

"Some manufacturers and importers of toilet preparations announced that they would allow extra dating on orders placed for shipment before June 21st when the tax will become effective. In view of amendment to the law, passed June 13th, it was necessary that all goods thus ordered be actually delivered before June 21st; otherwise the tax would apply. The amendment applies the tax to articles contracted for before May 1st but not delivered before the effective date of the excise taxes."

Architect's Sketch, American Institute of Pharmacy, Washington, D. C. It is hoped to break ground for the building on July 1st.